

## **Annual sanitary report of the Province of Assam.**

### **Contributors**

Assam (India)

### **Publication/Creation**

Shillong : [Government Press] (Printed at the Assam Secretariay Printing Office), [1913]

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# ANNUAL SANITARY REPORT

OF THE

PROVINCE OF ASSAM

FOR THE YEAR

1913

BY

THE HON'BLE LIEUT.-COL. H. E. BANATVALA, I.M.S.,  
OFFG. SANITARY COMMISSIONER, ASSAM.



SHILLONG :

PRINTED AT THE ASSAM SECRETARIAT PRINTING OFFICE.

1914.

*Price eleven annas.]*

*[Price 1s.*





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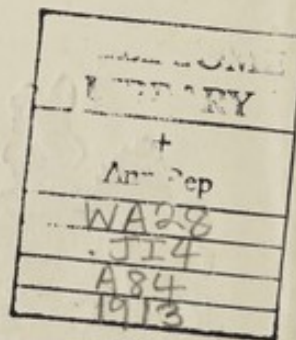
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FROM

THE HON'BLE LIEUT.-COLONEL H. E. BANATVALA, I.M.S.,  
OFFG. SANITARY COMMISSIONER, ASSAM,

TO

THE SECOND SECRETARY TO THE CHIEF COMMISSIONER  
OF ASSAM.

*Dated Shillong, the 16th May 1914.*

SIR,

I have the honour to forward herewith the Annual Sanitary Report of the Province of Assam for the year 1913.

I have the honour to be,

SIR,

Your most obedient Servant,

H. B. BANATVALA, *Lieut.-Colonel, I.M.S.,*  
*Offg. Sanitary Commissioner, Assam.*

*Enclosures—*  
Report—1.  
Statement—13.

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# ANNUAL SANITARY REPORT

OF THE

## PROVINCE OF ASSAM

FOR THE YEAR

1913.

### SECTION I.

#### METEOROLOGY.

The Director General of Observatories has furnished the following brief summary of the chief meteorological features prevailing in the province during the year 1913 :—

*"The cold-weather period of January and February.*—January was even drier than usual, with a deficiency of 29 per cent. in the rainfall, while February was remarkably wet with an excess of 166 per cent. The departures from the normal of climatic elements other than rainfall were of no great significance."

*"The hot weather period, March to May.*—In all these three months, rainfall was in excess and day temperatures were appreciably below the normal. A spell of comparatively cool weather was experienced in the fourth week of May when at some stations the afternoon temperature was persistently in large defect. Humidity and cloud on the whole differed to no great extent from the normal."

*"The monsoon period, June to September.*—About the average amount of rain fell during the first two months, but in August and September the monsoon was weak and the rainfall given by it was appreciably less than the normal amount. The aggregate fall of the season was more or less short of the average at all the observatories with the exception of Shillong, but the deficiency was in all cases less than 25 per cent. Temperature and humidity did not present any marked abnormal features, while the cloud proportion was on the whole distinctly low."

*"The period, October to December.*—Assam received considerably more rain than usual in October notwithstanding that there was less than the customary amount of cloud. In November the sky was unusually free from cloud and scarcely any rain fell. In December the weather was unusually cloudy and rainy owing to the early commencement of winter action."

The price of common rice ranged from  $7\frac{1}{8}$  seers to the rupee in Goalpara to  $9\frac{1}{2}$  seers in Darrang, Nowgong, and Cachar during the year 1913.

Price of food-grains and their connection with vital occurrences.

The average agricultural outturn of the province was normal.

### SECTION II.

#### EUROPEAN ARMY.

[No remarks.]

### SECTION III.

#### NATIVE ARMY.

[No remarks.]

### SECTION IV.

#### JAILS.

[No remarks.]

### SECTION V.

#### GENERAL POPULATION.

[Vital Statistics.]

2. The population of the province according to the census of 1911 is 7,059,857 including Manipur State. The population of the plains districts is 6,051,507, of which 3,139,897 are males and 2,911,610 females. The ratios in this report are calculated on this population.

General Census figures. Provincial birth and death-rates. Comparison with other provinces.



The population of the hill districts and Manipur State is 1,008,350. Of this, the population under registration is 192,656, the Khasi and Jaintia Hills contributing 54,228, the Lushai Hills 91,204, the Garo Hills 44,801 and the Naga Hills 2,423. The result of the registration in these areas is shown in paragraph 10 of the report.

*Statement comparing the birth-rate of Assam with that of other provinces in India.*

	Birth-rate.		
	1907-1911.	1912.	1913.
1	2	3	4
Assam ... ..	31.90	32.16	33.06
Bengal ... ..	34.83	35.30	33.75
Bihar and Orissa ... ..	39.09	42.52	42.10
Central Provinces ... ..	46.38	48.24	49.26
Madras ... ..	32.1	30.90	32.2
Burma ... ..	34.40	32.13	32.61
Bombay ... ..	35.53	34.97	34.96
United Provinces ... ..	39.36	45.38	47.67
Punjab ... ..	41.50	45.30	45.40
North-West Frontier Province ... ..	33.68	37.07	36.17

The provincial birth-rate per mille for the year was 33.06, which is higher than that of the year 1912 and of the quinquennial period 1907-1911.

The following statement compares the death-rate in Assam with that of other provinces :—

	Death-rate.		
	1907-1911.	1912.	1913.
1	2	3	4
Assam ... ..	27.06	25.04	27.66
Bengal ... ..	29.02	29.77	29.38
Bihar and Orissa ... ..	35.09	31.01	29.14
Central Provinces ... ..	34.04	42.34	30.28
Madras ... ..	24.0	20.30	21.4
Burma ... ..	27.56	27.04	24.99
Bombay ... ..	29.20	34.88	26.63
United Provinces ... ..	43.43	29.91	34.84
Punjab ... ..	42.70	26.63	30.20
North-West Frontier Province ... ..	27.91	23.39	24.65



The provincial death-rate for the year was 27·66 per mille. It is higher than that of the year 1912 and of the quinquennial period 1907-1911.

3. The provincial birth-rate was '90 in excess of the previous year and 1·16 in excess of the average mean of the quinquennium 1907-1911.

Birth registration—General.

The total number of births registered during the year was 200,075, or 33·06 per mille of population. The district of Goalpara recorded the highest rate, 40·17, followed by Darrang (35·65), Sibsagar (33·68), and Sylhet (32·98). The lowest rate was recorded in Lakhimpur, 29·23. The comparatively deficient birth-rate in the Lakhimpur district is partly due to the fact that a large proportion of the population is composed of the labour force employed on the tea gardens and other new industries of this district. This section of the population from various economic and social causes does not, in the earlier years of settlement, reproduce itself with the vigour displayed by an indigenous settled population.

Compared with the rate of the previous five years, there was an increase of '97 per mille during the year under report. The increase has been shared by the districts of Goalpara, Darrang, Sibsagar, Lakhimpur and Sylhet. The natural increase of population, *i.e.*, excess of births over deaths per 1,000 of population, was 5·40. The natural increase which varied from 2·95 in Darrang to 12·78 in Sibsagar has been shared by all districts in the province.

4. The total number of births in urban areas in 1913 was 3,307, and the birth rate per mille of population was 27·50, as compared with 3,329 and 27·69, respectively, in the preceding year. As in the previous year, the highest rate was recorded in the town of Barpeta, 48·70. The next highest rate was in Jorhat 45·68. These comparatively high figures for Jorhat and Golaghat are partly due to energetic checking of vital statistics by the vaccination inspection staff. The figure is probably somewhat inflated, as the Deputy Sanitary Commissioner has noticed that omissions relating to previous years, when discovered, are credited to the births of the current year. Instructions will be issued to prevent the disturbance of statistical returns so arising by ensuring that only omissions relating to the year in which they are discovered should be computed in the returns for that year. The rates in Sunamganj, Maulvi Bazar and Hailakandi were below 10 per mille. Much of this defect is probably due to defective registration, as there is nothing in the age and sex composition of these towns to produce such an abnormally low birth-rate. Orders will be issued to correct this default.

5. The total number of births registered in rural areas in 1913 was 196,768, or 33·17 per mille of population, as compared with 191,347 and 32·26, respectively, in 1912.

Birth registration in rural areas.

*Registration circles*—Considered individually, the highest rate—67·80—was recorded in Guma circle of the district of Goalpara. The next highest rate—56·20—was recorded in Kanairghat circle of the district of Sylhet. The lowest rates (below 20) were recorded in Doomdooma circle (13·23), Lunding circle (13·80), Polasbari circle (17·03) and Sonari circle (18·29). The defect in the birth-rate of the Doomdooma circle is said to be due to a mistake in compilation, by which returns belonging to this circle have been entered in the Dibrugarh thana returns, but this does not appear probable from a scrutiny of the figure for this thana, which, being 24·34, does not appear unduly inflated. The population of this registration circle consists of indigenous Assamese and *ex-tea* garden labourers who have settled in the district as cultivators, and in spite of increased activity in the work of checking of statistics in this circle, the birth-rate is lower for this year than in the previous year. The whole of the registration in this area should be carefully and systematically checked with the object of determining whether the defect is real or artificial. The same remarks apply to the Lunding, Polasbari and Sonari registration circles, on which comment was made in the Sanitary Report of 1912.

The difference between the urban and rural birth-rates is due to the difference in the age and sex distribution in these areas.

6. Altogether 167,379 deaths were reported in 1913 against 151,566 in 1912 and 163,785, the average of the five years 1907-1911, the corresponding ratios being 27·66, 25·04 and 27·06, respectively. Compared with the quinquennial average, there was an increase in three districts, *viz.*, Cachar, Sylhet and Goalpara, and a decrease in five.

Death registration.—General.

7. The total number of deaths registered in urban areas during the year under report was 2,549 and the death-rate per mille of population was 21·20, as compared with 2,501 and 20·80, respectively, in the preceding year. The highest rate was recorded in Nowgong (31·84) and the

Death registration in urban areas.



lowest rates were recorded in Hailakandi (5.47) and Karimganj (10.90). The smallness of the Karimganj figure is largely due to want of attention on the part of the municipal authorities and to lack of checking by the vaccination inspecting staff.

8. The total number of deaths registered in rural areas in 1913 was 164,830, or 27.79 per mille of population, as compared with 149,065 and 25.13, respectively, in 1912. The highest rate (34.08) was recorded in rural areas in the district of Goalpara and the lowest rate (20.98) was recorded in rural areas in the district of Sibsagar.

Registration circles considered individually, only Guma circle in Goalpara reported a rate over 50 per mille and 1st and 2nd and 4th and 5th Sidli circles, and Lakhimpur circle in Goalpara, Panery circle in Darrang and Kanairghat circle in Sylhet reported rates over 40 per mille. The Civil Surgeon proposes to depute the vaccination inspecting staff to take up one or more circles in Sidli, Bijni and Guma and test the figures in every village in these circles in the next recess.

Rates below 20 per mille were reported in Gauhati circle (18.98), Jorhat (17.49), Sonari (13.12), Doomdooma (11.25), Polasbari (10.88) and Lumding (9.37).

The same remarks apply to these low figures under deaths as for births in paragraph 6.

9. The system of verification of vital statistics in urban areas introduced last year has been continued during the year under report. The exact population of each area under examination was ascertained from the census figures for the purposes of this enquiry. The investigation of unregistered vital occurrences was limited to those omitted within a period of twelve calendar months previous to the date of enquiry. The number of births and deaths reported to have occurred during the same period in the area in question was ascertained by inspection of the birth and death registers, and the number of births and deaths which had actually occurred during this period was ascertained by house to house visitation. The object of this enquiry was to contrast the recorded birth and death-rate with the actual birth and death-rate as determined by the examination so as to ascertain the exact degree of defect in each town.

The subjoined table shows the defect in registration which is revealed by this method of checking :—

Municipalities.	Unregistered vital occurrences detected during previous 12 months.		Recorded vital occurrences during previous 12 months.		Percentage of omissions.	
	Births.	Deaths.	Births.	Deaths.	Births.	Deaths.
1	2	3	4	5	6	7
Silchar	14	5	170	199	7.60	2.45
Sylhet	3	1	82	43	3.33	2.27
Dhubri	10	2	221	110	4.32	1.72
Goalpara	24	8	216	125	10.0	6.01
Gauhati	63	22	276	218	18.58	9.16
Barpeta	15	8	67	43	18.29	15.69
Tezpur	32	7	141	59	18.49	10.60
Nowgong	2	1	181	123	1.09	.80
Golaghat	49	14	183	94	21.12	12.96
Jorhat	131	22	185	93	41.45	19.13
Sibsagar	23	2	166	16	12.17	11.11
Dibrugarh	...	...	242	113	...	...
Total	366	92	2,130	1,236	14.66	6.92

There is an average defect of 14.66 per cent. in birth registration and of 6.92 per cent. in death registration.

The maximum defect in birth registration was discovered of 41.45 per cent. in birth registration and 19.13 per cent. in death registration in Jorhat. The percentage of omission discovered by the same observer in the town of Golaghat is also high.



It must be remembered that, other things being equal, the number of omissions discovered is in direct relation to the activity displayed by the investigator, and that, as the omissions reported by him are brought up for investigation by a Magistrate in the course of the prosecution of the defaulter, the figures for omissions are not easily 'cooked' and the probabilities are that the high figures are fairly reliable, while the low figures are in some cases less so. In the course of this investigation only four omissions are reported to have been discovered in Sylhet, whereas in the course of the ordinary checking apart from this special investigation, 28 omissions were reported. In this town out of 404 births and 338 deaths recorded, only 211 of such vital occurrences were verified. I think it is safe to assume that the verification was badly performed rather than that the registration is unusually good. Dibrugarh is an example of a town in which no omissions have been discovered, and where constant attention and verification appear to have produced an unusually high standard of registration. The investigation as a whole shows the need for continued activity in hunting down defaulters if any reliance is to be placed on returns from areas of compulsory registration under the present system.

3,698 entries of births and 2,221 entries of deaths were tested by the vaccination inspecting staff during the year under report in urban areas where registration is compulsory. 383 omissions (or 11 per cent. to the total number of vital occurrences registered) were detected. The defaulters were duly reported to District Magistrates for prosecutions. 324 persons were prosecuted and 168 were convicted.

Proposals have been submitted to the Local Administration for conducting registration in urban areas through the agency of Sub-Assistant Surgeons as registrars and for enabling these registrars to grant certificates which will have a legal status as evidence of birth and of death. It is hoped that considerable improvement will be effected in this department of work if these proposals are sanctioned, and also from a more general knowledge of the obligation to register, which has resulted from the activity in detection and prosecution of defaulters in the year under review.

Ten Sub-Assistant Surgeons are in course of training under the Health Department of the Bombay Municipality as Municipal Sanitary Inspectors, and it is proposed to appoint them as registrars of vital statistics in the towns to which they will be posted as Sanitary Inspectors.

In Hailakandi, Karimganj, Maulvi Bazar, Habiganj, Sunamganj, Mangaldai, Dibrugarh and North Lakhimpur, no prosecutions were made during the year; in the towns mentioned, except Dibrugarh, enquiries were either not made, or were imperfectly carried out.

10. As stated in paragraph 2, registration is only partially carried out in the districts of the Naga Hills, Garo Hills, Khasi and Jaintia Hills and Lushai Hills. An enquiry was made during the year under report as to how registration can be improved and extended throughout these districts. It appears that, owing to the illiteracy of village headmen, it is not practicable to effect much improvement in registration at present, but it is hoped that, with the spread of education in villages, it will improve gradually. A scheme for the introduction of a system of registration in the North Cachar Hills has been forwarded for the approval of the Commissioner, Sarma Valley and Hill Districts, and the subject is under his consideration.

The recorded birth and death-rates in these hills compared with those of the previous year are shown in the subjoined table :—

	1912.		1911.	
	Birth-rate.	Death-rate.	Birth-rate.	Death-rate.
1	2	3	4	5
Khasi and Jaintia Hills ... ..	29.26	18.40	28.21	24.19
Naga Hills ... ..	21.87	25.58	32.19	18.93
Lushai Hills ... ..	35.98	26.81	37.58	32.03
Garo Hills ... ..	30.98	25.93	29.35	24.78

288 births and 156 deaths were registered in Shillong during the year under report against 252 and 200, respectively, of previous year.

The Civil Surgeon, Garo Hills, reports that some deaths from measles and chicken-pox are erroneously included in those from small-pox.



Cases of leprosy are frequently seen among the Garos, but only two cases sought admission into hospital for treatment. The prevalence is said by the Garos to be due to consumption of a small kind of dry fish called "Nakam." The disease appears to be less prevalent now than in former years.

11. The following table shows the vital occurrences reported from tea estates in Registration in tea gardens. 1913 :—

						Birth-rate.	Death-rate.
1						2	3
Cachar	...	...	...	...	...	22.20	22.87
Sylhet	...	...	...	...	...	27.11	22.08
Goalpara	...	...	...	...	...	46.02	86.72
Kamrup	...	...	...	...	...	12.78	12.78
Darrang	...	...	...	...	...	25.08	30.98
Nowgong	...	...	...	...	...	9.68	15.08
Sibsagar	...	...	...	...	...	31.53	25.30
Lakhimpur	...	...	...	...	...	27.91	29.31
Total						26.66	25.47

The birth and death-rates in tea estates during the year under report were 26.66 and 25.47, respectively, against 27.22 and 23.64, respectively, in 1912.

In the Goalpara district, 26 births and 49 deaths occurred in a tea-garden population of 585. In considering the small natural increase in the tea garden population, as estimated by the excess of births over deaths, and taking into account the age and sex distribution, which is such as to lead one to expect greater fertility, an interesting sociological problem presents itself for solution. The economic conditions of life among the labour force are favourable, owing to the amount of care and thought which is devoted by the tea industry towards maintaining the health of the labour force at as high a level as is economically possible, and a higher birth-rate might be expected. An important factor in producing the defective birth-rate appears to be due to voluntary limitation of births, a practice which is not confined to highly civilised and sophisticated communities.

12. The total number of births and deaths registered within railway limits during the year were 101 and 259, respectively, against 143 and 323, respectively, of the previous year.

13. As usual the birth-rates were highest in the cold-weather months of January, October, November, and December and lowest in the rainy months of June and July.

The highest death-rates were recorded in the months of September, October, November and December and the lowest in the months of February and March.

14. Details showing the registration of deaths during the year 1913 according to Mortality according to age, sex, age and class will be found in Statements II, IV and V attached to this report.

As in the previous year the death-rate was the highest among infants under one year. The lowest rate was recorded amongst persons between 10 and under 15 years. The mortality during the year was high among both males and females compared with that of the previous year. The ratios are 28.06 for males and 27.22 for females, against 25.37 and 24.69, respectively, of 1912.

Mortality according to class was for Christians 18.99, Hindus 25.79, Muham-madans 29.84, Buddhists 13.22 and other classes 32.96, against 18.28, 23.93, 23.75, 4.88 and 37.19, respectively, of the previous year.



15. The total number of births and deaths verified by the vaccination inspecting staff during the year was 95,203, against 85,993 of the previous year, showing an increase of 9,210 cases.

Inspection of village registers.

The percentage of omissions detected to total number verified was 4·7 against 3·7 of the previous year. In the districts of Sibsagar and Kamrup the inspecting staff displayed considerable activity and detected omissions of 15·8 per cent. and 11·9 per cent., respectively. As in the last year, the percentage was the lowest in Cachar, 5. This small number of omissions found is stated to be due to the greater number of chaukidars in proportion to the population, as compared with the Sylhet district, in which the chaukidari system of collection is also in force, and to the fact that the district administration has devoted considerable attention to obtaining accuracy in registration. It is noteworthy that none of the rural areas in Cachar report a suspiciously low birth-rate, probably the rural registration in Cachar is comparatively good. So much depends on the relative activity of the members of the inspecting staff and the accuracy of their returns that it is impossible to say more from these figures than that the general percentage of defect in registration may be a deficiency of 15 per cent.

16. Vital statistics are collected by chaukidars in Sylhet, Cachar and in a portion of Goalpara, while in Kamrup, Darrang, Nowgong, Sibsagar, Lakhimpur and in the remaining portion of Goalpara they are collected by gaonburas. The former report to thana officers and the latter to mauzadars, who in their turn submit their returns to Civil Surgeons, where the district return is compiled.

General accuracy of vital statistics and improvements effected during the year.

The areas of specially bad registration referred to in last year's report received the special attention of the Civil Surgeons and the vaccination inspecting staff. The Deputy Commissioners also helped by inflicting fines on gaonburas and chaukidars who were repeatedly reported for negligence, some of them being dismissed.

I again repeat the recommendations made in the Sanitary Report of 1912 regarding the measures to be taken in improving the accuracy of registration upon the present system :—

- (1) More energetic checking of returns by the vaccination inspecting staff.
- (2) Punishment of defaulting chaukidars.
- (3) Encouragement of good reporting by remissions of land revenue and gifts of gold rings to gaonburas in districts where the Assam system is in force.

To these I would add the suggestion that District Officers should annually furnish returns to this office of the number of gaonburas to be rewarded for good work in reporting vital statistics, and that a sum of money be placed in the budget of the Sanitary Commissioner for providing the cost of gold rings to be distributed on the recommendation of the District Officers. It should also be considered whether the number of gaonburas or chaukidars in areas of defective registration is not comparatively inadequate.

Enquiry was made whether the services of independent medical practitioners could be utilized in verifying causes of death on a fixed rate of allowances on the system on trial in the United Provinces. It appears that the number of independent medical practitioners in Assam is very small and that the introduction of this procedure is not likely to be useful.

## SECTION VI.

### HISTORY OF CHIEF DISEASES.

#### 17. Chief causes of mortality.

Diseases.	1903—1912.			1913.		
	Urban.	Rural.	Combined.	Urban.	Rural.	Combined.
1	2	3	4	5	6	7
Cholera ... ..	2·46	2·74	2·74	1·16	2·74	2·71
Small-pox ... ..	·93	·46	·46	·22	·46	·46
Plague ... ..	·02	...	·0005	...	...	...
Fevers ... ..	10·03	13·39	13·32	9·56	14·53	14·43



Diseases.	1903-1912.			1913.		
	Urban.	Rural.	Combined.	Urban.	Rural.	Combined.
1	2	3	4	5	6	7
Dysentery and diarrhoea ...	2.98	2.32	2.33	2.79	2.62	2.62
Respiratory diseases ...	.48	.37	.33	1.07	.70	.71
Injuries ...	.39	.30	.30	.57	.30	.30
All other causes ...	6.26	6.18	6.18	5.80	6.42	6.41
Total ...	23.37	25.80	25.75	21.20	27.79	27.66

The returns of mortality from the chief diseases follow the average of the preceding decennium very closely. There is a slight increase in the deaths returned under the head of fevers.

### 18. Cholera.

Districts.	Death-rate per mille.	
	1903-1912.	1913.
1	2	3
Cachar ...	2.13	3.50
Sylhet ...	2.55	3.76
Goalpara ...	2.29	.81
Kamrup ...	4.46	4.21
Darrang ...	4.11	1.37
Nowgong ...	3.67	3.00
Sibsagar ...	2.44	.80
Lakhimpur ...	1.23	.31
Total ...	2.74	2.71

The total death returns, as a whole, are practically the same as the average of the preceding decennium.

The Surma Valley Division had a higher death-rate from cholera than in the previous year, the Assam Valley Division a lower one.

19. Seven towns reported deaths above 1 and below 6 per mille, *viz.*, Habiganj (5.28), Dhubri (3.26), Silchar (3.07), Maulvi Bazar (2.95), Karimganj (1.84), Goalpara (1.50) and Nowgong (1.47). This contrasts favourably with the rates of the previous year when the ratio in one town rose as high as 10.6. No deaths from cholera were reported from Jorhat, Golaghat, North Lakhimpur, Mangaldai and Hailakandi. The appearance of cholera in towns such as Dhubri is probably very

High rates of mortality from cholera in individual towns and rural areas.

largely due to the serious defects in the conservancy systems of such towns. These defects give ample opportunities for the operation of the influence of the human carrier exerted through the agency of the fly, in causing the recrudescence and propagation of the disease.

As regards rural circles, the Rangia circle 6·84 in Kamrup, Lakhipur 6·25 in Cachar, Balaganj 6·17, Habiganj 5·70 and Maulvi Bazar 4·97 in Sylhet and Raha 4·69 in Nowgong showed a relatively high incidence of the disease.

The Civil Surgeon of Sylhet reports that, though there was no serious epidemic during the year under report as in 1912, yet there were virulent local outbreaks in some places in certain rural areas of this district, especially in those low-lying tracts whose inhabitants have no other source of drinking water than the water of "hawars." Six Sub-Assistant Surgeons and an Assistant Surgeon were posted on cholera duty in the district. They were supplied with portable cases for the administration of hypertonic saline solution, but this method of treatment does not appear to be of practical value in the hands of itinerating Sub-Assistant Surgeons, under the conditions in which they work, nor does the treatment commend itself to popular favour. In connection with this outbreak the Civil Surgeon, in an interesting note published in the *Indian Medical Gazette*, drew attention to the futility, savouring of quackery, of sending out Sub-Assistant Surgeons with a few drugs to combat an epidemic of cholera, and advocates our admitting frankly that our mission should be one of simple advice upon preventive lines rather than an unrealisable attempt at treatment and cure.

A five years' scheme for the improvement of rural water-supply for each subdivision of the district is under preparation. The progress of this scheme, year by year, will eventually improve the rural water-supply and do much to mitigate the severity of these outbreaks.

In Kamrup, Nowgong and Cachar no epidemic was reported, although cholera broke out here and there in sporadic form. The Civil Surgeon of Nowgong remarks "that there was an appreciable decrease in the mortality from cholera, and that the disease, unlike previous epidemics (1910-12), appeared in sporadic form and after the monsoon." A scheme for the improvement of water-supply by means of protected wells in areas which are now supplied by the highly polluted water of the Kallang river is under preparation for the Nowgong district.

20. 1,324 deaths from cholera yielding a ratio of 1·88 per mille were reported from tea estates during the year against 1,220 and 1·73, respectively, of 1912.

Cholera in tea garden.  
21. *Small-pox.*

Districts.	Death-rate per mille.	
	1903-12.	1913.
I	2	3
Cachar	·11	·006
Sylhet	·16	·47
Goalpara	·38	·59
Kamrup	1·55	1·02
Darrang	1·20	·82
Nowgong	1·30	·43
Sibsagar	·28	·14
Lakhimpur	·13	·07
Total	·46	·43



Neither in detail, nor in general, do these statistics show any noticeable departure from the mean of the previous decennium.

22. Out of 19 towns, 13 reported no deaths from small-pox and six reported rates below 1 per mille. First and 2nd and 4th and 5th Sidli circles and Lakhipur circle in Goalpara reported the highest rates 7·94, 3·01 and 3·45, respectively. These Sidli circles reported the highest rates in 1912 also. The Civil

High rate of mortality from small-pox in individual towns and rural areas.

Surgeon notes that the vaccination inspecting staff will be deputed to test the accuracy of these returns by house-to-house enquiry, and he puts forward certain recommendations for obtaining earlier information as to the appearance of epidemic disease in remote areas of the district. These recommendations are receiving departmental attention.

### 23. *Fever.*

Districts.	Death-rate per mille.	
	1903-12.	1913.
1	2	3
Cachar ... ..	10·63	11·85
Sylhet ... ..	10·39	12·45
Goalpara ... ..	25·20	29·30
Kamrup ... ..	14·98	13·85
Darrang ... ..	19·56	18·30
Nowgong ... ..	14·90	15·57
Sibsagar ... ..	11·23	10·74
Lakhimpur ... ..	10·76	10·83
Total ... ..	13·32	14·43

There is no very appreciable increase over the figures of the previous decennium.

*Malaria.*—The Civil Surgeon of Goalpara reports that an epidemic of malarial fever occurred round Mankachar, to deal with which a Sub-Assistant Surgeon was deputed and a considerable quantity of quinine was sold.

*Anti-malaria measures.*—A certain amount of jungle-clearing and improvement of drains at Nongpoh, a halting place in the Khasi Hills on the Gauhati-Shillong road, and a protected water-supply in the form of a well was provided, while similar measures were taken in the town of Haslong. No anti-malarial work of any magnitude has been undertaken in Assam, as the sanction of the Government of India to proposals, submitted in 1912, for the appointment of a special malarial officer is still awaited. The conclusion of the special *kala-azar* survey of the province has now cleared the ground for research work in malaria, and an exceptionally interesting and profitable field of labour now lies open for research.

The conditions of Assam differ materially from those prevailing in the parts of India in which malaria has up to now received most attention. The moist climate, the abundant vegetation and sparse population of Assam sharply differentiate its malariology from that of countries with dry climates, which, with a small rainfall, scanty vegetation and paucity of permanent collections of water, are thickly populated by inhabitants, who tend to live in aggregated groups of villages and towns. In such dry countries epidemic malaria at times assumes very formidable proportions, and is productive of much morbidity. In Assam, on the one hand, the climatic and meteorological conditions and the sparse and unaggregated population do not appear to supply the factors necessary for the production of malaria in its intense epidemic form. On the other hand, it is probable that in certain places and under certain conditions the endemic prevalence is maintained at a constantly high level.



It is probable that the malarial problems of the province will present themselves in three different aspects:—

*First*, the malaria of the alluvial and riverain tracts, which would include the greater part of the plains districts, with their indigenous inhabitants.

*Second*, the malaria of submontane tracts or "Terai" country, *e.g.*, the lower levels of the Khasi and Jaintia Hills, of the Garo Hills and other "terai" tracts.

In such places the population is sparse and the intensity of the infection is probably due to the proximity of uncleared jungle with the shelter for mosquitoes and the favourable breeding grounds which it affords to species of mosquitoes which are active and efficient malaria carriers.

Beyond endeavouring to instil a knowledge of the virtues of quinine into the inhabitants and placing the drug itself within easy reach, it is difficult to see what other practical measures can be proposed for the mitigation of malaria in such tracts, as the clearance of jungle and opening up of the country, and other similar changes, which may some day diminish its malaria breeding capacities, must depend upon economic developments beyond our control.

*Third*, malaria of tea estates:—

The malariology of the tea districts is that of the riverain tracts in which the balance of nature has been profoundly altered by clearance of jungle and tillage of the soil on the one hand, and, on the other hand, by the aggregation thereon of large numbers of labourers, all of them foreign to the soil and climate, of whom a more or less constant proportion are new comers and unacclimatized. In the important tea industry of Assam, involving, as it does large financial interests, the importance of preventing inefficiency among the labour force is well recognised by the educated European community, who work it. That malaria is the commonest cause of such inefficiency is a fact that is now thoroughly well recognised by all. The tea districts being for the most part free from the presence of *kala-azar*, and with a population controlled by educated Europeans and with a European medical staff fully conversant with its health problems, present a peculiarly favourable opportunity for malarial research. A successful investigation of the conditions producing malaria in the tea districts could subsequently be applied to the consideration of the needs of the general population, upon which it would almost certainly throw much valuable light. The immediate results of such an investigation might also be of considerable value to the tea industry which would be prepared to put practical recommendations to a practical test.

It is quite within the bounds of possibility that successful research by determining the carrier mosquitoes and ascertaining their breeding grounds might demonstrate that the cost of reducing breeding in the breeding grounds which are responsible for maintaining the stock of carrier mosquitoes at fever-propagating level would prove to be, for the tea industry, a commercial proposition and not an unremunerative expense of a philanthropic nature. The opportunities for profitable malarial research work, and for a practical application of the conclusions derived from it are, therefore, unusually favourable in Assam.

24. Nowgong town reported the highest death-rate, 17·85, and North Lakhimpur, Mangaldai, Barpeta, Tezpur, Jorhat and Goalpara recorded death-rates varying from 11 to 14 per mille. The lowest rate was recorded in Hailakandi, 1·36.

High rate of mortality from fever in individual towns and rural areas.

As regards rural areas, highest rates were reported from circles of Goalpara varying from 26 to 68 per mille. Panery circle in Darrang also reported a death-rate of 35·47, much of which is due to *kala-azar*.

25. *Kala-azar*.

Districts.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.
1	2	3	4	5	6	7	8	9	10	11
Cachar	...	3	...	22	5	6	2	3	2	8
Sylhet	1,020	955	743	576	561	454	865	549	304	444
Goalpara	64	86	90	49	32	81	87	135	192	208
Kamrup	478	409	438	516	385	378	450	354	385	294
Darrang	1,611	1,106	808	845	649	643	627	679	563	309
Nowgong	595	379	215	293	146	140	221	286	308	417
Sibsagar	...	...	6	11	2	1	...	94	31	29
Lakhimpur	...	2	17	...	5	...	50	11	...	1
Total	3,748	3,030	2,407	2,227	1,736	1,703	2,303	2,051	1,875	1,798



During the year under review, the provincial *kala-azar* survey was continued, and the results of the finished survey are now available.

These may be summarised as follows:—

In the following areas the disease exists in endemic form and shows a certain amount of activity.—

- (1) In the district of Nowgong.
- (2) In the Mangaldai subdivision.
- (3) In the Dudnai thana of Goalpara district.
- (4) In the Gauhati subdivision.

It exists in a few scattered villages, but in a quiescent state—

- (1) In the Barpeta subdivision and North Kamrup.
- (2) In Tezpur subdivision.
- (3) In Dhubri subdivision.
- (4) In Golaghat subdivision.

In the Nowgong district, there is undoubtedly some activity in the disease which is attacking the young and susceptible population of children which has sprung up since the "earthquake" epidemic. The activity of the disease is not confined to any particular centre, but is widely spread throughout the eastern half of the district. The situation is more serious in Nowgong than elsewhere on account of the economic importance of the district, its proximity to the uninfected districts of the Upper Valley, and the greater activity of the disease. In Mangaldai, the conditions are somewhat similar, but the activity is not so great.

In the Goalpara and Gauhati subdivisions there is a fair amount of disease, but of a more chronic and less spreading type than in Nowgong. In Tezpur and Barpeta and Dhubri there are only a few sporadic cases scattered here and there, and there is no tendency to activity, or to the agglutination of the disease round centres. The Rangiya centre in Kamrup shows no signs of activity. Cases of *kala-azar* are to be found in villages round Chattak, Sunamganj, Jaldhup, and Nabiganj, but in these areas the disease is not nearly so active, nor are the infected persons so numerous as in the infected areas in the Assam Valley. The remainder of the district is free from the disease, indeed it has died out in places in which it formerly existed. *Kala-azar* is of no practical importance in the morbidity of the Sylhet district and requires no special measures of observation or control.

For the observation and control of the disease, the following recommendations have been made:—

- I. The appointment of six Sub-Assistant Surgeons, each equipped with the apparatus of a travelling dispensary, to tour through the endemic areas, treat infected persons, and keep the Sanitary Department informed as to the behaviour of the disease. They should also supervise and aid in any measures of segregation and removal which may be put in force.

Sanction has been accorded to this proposal, and these travelling dispensaries will be in the field next cold weather. They are to be equipped with pack transport to enable them to reach the remotest villages of the area allotted to them.

- II. The introduction of measures of control, by putting in force the provisions of the Epidemic Diseases Act, to limit and control the migration of persons living in infected villages.

These recommendations are still under the consideration of the Local Administration.

The complete report on the *kala-azar* survey of the province will be published in the supplement to this report.

In regard to the figures returned as deaths from *kala-azar* in the district of Sylhet it is clear that these deaths are for the most part erroneously classified. An investigation into the prevalence of *kala-azar* in the Sylhet district, which was carried out under the Civil Surgeon and subsequently verified and amplified in detail by the provincial investigation carried out under the Deputy Sanitary Commissioner, shows the nature of this error. Major Scott in his report notes as follows:—

One of the first difficulties met with by K. K. Chakravarty was the inaccuracy of the information obtained from certain of the police stations. Village after village shown in the thana registers as returning deaths from *kala-azar* were found to be quite free of the disease. Not only were no cases of *kala-azar* found, but the choukidars entirely denied having reported such deaths to the police station, and no such entries were to be found in their "*hatchita*" books. Many of them in fact had never heard of the term *kala-azar* and were ignorant of the disease. It was therefore necessary to start again at the thana office and find out how these entries had got into the death register. After a good deal of cross-



examination it was at last ascertained that the Sub-Inspector, or more usually the writer-constable, in charge of the birth and death registers was the source of these entries. Among the columns for the different diseases under which deaths are recorded in the death register there are two headed *zar*-(fever) and *kala-azar*-(black fever) side by side. A village chaukidar, as a rule, reports all deaths from febrile diseases, and in fact a great many others whose cause is doubtful under the heading "*zar*" (fever). In many thanas the "*kala-azar*" column is regularly left blank. But in others it is the *dastoor* (custom) to fill it up, and a certain number of the chaukidar's fever deaths go down in the column headed "black fever." An enterprising writer-constable often questions the chaukidars as to the cause of doubtful deaths and takes upon himself to decide whether a particular death shall go down in the column headed "*zar*" or that headed "*kala-azar*." Often the constable's knowledge on which he bases the distinction is quite as vague as the chaukidar's. Thus 186 villages reported by the thanas as infested were found free of all traces of the disease.

The thanas which make the largest number of such incorrect returns are, in order, Maulvi Bazar Sylhet and Nabiganj. The first two of these suffered badly from *kala-azar* some years ago, and, though they are now nearly free, the thana officers appear to have kept up the *dastoor* of filling in the "*kala-azar*" column of the death register in the manner just described. Nabiganj actually contains a large number of infested villages in addition to those wrongly returned as such.

On the other hand, very few infested villages were found which had escaped note in the thana books. Where the disease actually exists, the fact is usually known and the chaukidar is fairly familiar with its symptoms. Even in such villages cases of ascites and renal dropsy were found to have been diagnosed as *kala-azar*.

In spite of the above rather gross inaccuracies therefore it was found that those thanas returning the deaths from *kala-azar* either are the most severely infested or were some years ago, while those returning no *kala-azar* are probably fairly free of the disease. The error is very much in the direction of exaggerating the number of *kala-azar* deaths."

To prevent this inflation of the *kala-azar* death returns by the activities of the writer-constable, no reports of *kala-azar* deaths should be entered as such, until the true cause of death has been verified by the Sub-Assistant Surgeon attached to the local dispensary, who for this purpose should be instructed to attend the thana on the day on which the village chaukidars come up to make their weekly report. He should then question those chaukidars who have reported deaths from *kala-azar* and decide as to their accuracy, no entries in the *kala-azar* column being made by the writer-constable without the attestation of the dispensary Sub-Assistant Surgeon.

The *kala-azar* operations aimed at the extirpation of the disease as it exists in certain villages of the Golaghat subdivision, whose infection, on account of proximity to the hitherto unaffected areas of the Upper Assam Valley, has been viewed with uneasiness, have been carried on with a considerable degree of success. In Khumtai, the original centre of the infection, no recurrence has occurred in any of the nine infested families who were moved in 1911; but two old cases still remain. In one house, two new cases have been discovered, the survivors of a family of six persons, one of whom was thought to be doubtfully infected in 1911. They were not moved from the infested site. All are now dead of *kala-azar* or have contracted it. This forms an interesting "control" as showing what may happen to an infested family remaining on an infested site. In Habisowa, there has been no recurrence in eight infested families who were removed in 1911. Two new cases were found in one previously uninfested family. In Padumani, there has been no recurrence in four infested families removed to a new site in 1911. There are no old cases and no new cases. In Doojooia, no recurrence has taken place in nine families removed to new sites in 1911; there are now no cases, old or new. In Batiporia Lukumani, there are no recurrences in eight infested families removed in 1911. One recurrence has taken place in a family in whom removal was imperfectly carried out. Three new cases were found in this village. In Batiporia Gorla there were no recurrences in two infested families moved. In Khongia, which adjoins Batiporia Lukumani, there were two new infections. In Kuralgori Bamongaon, three infested families were discovered last year, and two new infections were discovered this year. Thus, out of forty infested families removed to new sites three years ago, a recurrence of the disease in a person not obviously infected upon the old site has occurred in only one case.

The people appear to recognise the value of the measures, and are grateful to Government for carrying them out. The active centre of the disease is now in the villages of Batiporia Lukumani and in Kuralgori Bamongaon. Provided that no new and separate foci of the disease appear, it is quite possible that the disease may be extinct in this subdivision in a few years' time, if these measures of control are continued.



26. *Dysentery and Diarrhœa.*

Districts.	Death-rate per mille.	
	1903-1912.	1913.
1	2	3
Cachar ... ..	2.39	3.57
Sylhet ... ..	1.84	2.99
Goalpara ... ..	.42	.37
Kamrup ... ..	1.35	.70
Darrang ... ..	4.11	3.53
Nowgong... ..	2.06	1.51
Sibsagar ... ..	4.16	3.64
Lakhimpur ... ..	4.80	3.95
Total ... ..	2.33	2.62

The average is practically the same as that of the preceding ten years, but a slight increase is noticeable in Sylhet and Cachar, which is probably due to the high floods of June and July, which were followed by high prices of food-stuffs.

*Dysentery in tea estates—*

Darrang ... ..	8.75
Sibsagar ... ..	7.68
Lakhimpur ... ..	7.39
Sylhet ... ..	6.08
Nowgong ... ..	4.68
Cachar ... ..	4.20
Kamrup ... ..	0.89
Goalpara ... ..	42.48

27. *Plague.*—As in the last year, there were no cases of plague reported during the year under report.

28. *Other causes.*—The death-rates due to respiratory diseases, injuries and all other causes were .71, .30 and 6.41, respectively. The corresponding ratios of the year 1912 were .57, .31 and 5.89, respectively.

Complaints regarding mortality due to the alleged prevalence of tape-worm infection causing dysenteric symptoms in a village called Sarthibari in the Barpeta subdivision of Kamrup were investigated by the Civil Surgeon. The actual parasite was found to be a trematode worm, a Fasciolopsis, presumably Fasciolopsis Buski.

On the hypothesis that the intermediate host of this parasite is a water mollusc, steps have been taken to provide the infected village with a properly constructed and protected well.

## SECTION VII.

## VACCINATION.

[Published separately.]

## SECTION VIII.

## SANITARY WORKS—MILITARY.

[No remarks.]

## SECTION IX.

## SANITARY WORKS—CIVIL.

29. During the year 1912 there were 11 Municipalities, 4 Unions and 1 Station in the province. During the year under report two more Municipalities at Karimganj and Sunamganj and one new Union at Maulvi Bazar in Sylhet were constituted. The Union at Habiganj in Sylhet was converted into a Municipality during the year. Thus there were 14 Municipalities, 4 Unions and 1 Station towards the close of the year.



30. The total income of the above Municipalities, Unions and Stations, including the opening balance, amounted to Rs. 6,66,390 during the year 1913, against Rs. 6,60,258 of the year 1912. The expenditure on sanitation amounted to Rs. 3,04,769, against Rs. 4,43,907 of the previous year. The decrease of Rs. 1,58,124 in the expenditure on sanitation is due to a large fall of Rs. 1,50,377 under the head Water-supply. As stated in the report for the year 1912, materials for overhauling the Shillong Water-works and for constructing a new water-works at Jorhat were purchased. The presence of these two large items of expenditure in the total of the previous year accounts for its excess over the total of the expenditure of the year under review. The percentage of expenditure on sanitation proper, excluding that spent on construction and maintenance of roads, was 35.7 during the year under report, against 57.4 of the previous year. The work on the improvement of water-supply in the town of Golaghat was in progress and the percentage of expenditure of the Union rose as high as 70 per cent. Only one municipality in the province, *viz.*, that of Shillong, spent between 50 and 60 per cent. of its income on sanitation, 4 between 40 and 50 per cent., 3 between 30 and 40 per cent., 2 between 20 and 30 per cent., and 8 below 20.

The expenditure on conservancy in particular is in many cases far below the minimum necessary to maintain a reasonably efficient conservancy system. Modern research work has established the importance of the human carrier in originating epidemics of gastro-intestinal diseases, such as cholera, enteric, and diarrhoea, and has demonstrated the intimate connection which exists between imperfect conservancy, fly infestation, and the propagation of such epidemics. In the light of this knowledge, efficiency in conservancy can no longer be judged upon æsthetic or olfactory grounds, nor can a conservancy system be judged by absence of popular complaints as to its deficiencies. Accordingly, in the course of municipal inspections, considerable attention has been paid to this important subject, with the result that along with the demonstration of a dangerously low standard of efficiency as a whole many serious cases of deficiency have come to light. In general, the number of public latrines per head of population is deficient, the number of private latrines cleansed is relatively small, and their construction is for the most part absolutely insanitary. Owing to these various defects, only a small amount of matter can be collected, and the existing removal plant has a removal capacity equal to only a small fraction of the total amount which should be removed by a reasonably efficient conservancy system. So also, trenching grounds are small, and by ocular evidence appear to receive a very small proportion of the nightsoil produced by the community.

Facts and figures will shortly be laid before the Sanitary Board for decision on the following points:—

- (1) What should be the proportion of public latrines to the population of a town.
- (2) What is the minimum rateable value of holdings which should be compelled to provide a private latrine.
- (3) What minimum expenditure on conservancy per head of population should be accepted as sufficient.

Plans and estimates for various patterns of private latrine at a minimum cost of Rs. 30 and upwards, which shall embody the irreducible minimum of the sanitary requirements of such a structure, are now under preparation in connection with (2).

With regard to (3), it is obvious that like most other sanitary reforms, the ultimate difficulty is one of finance. Shillong, which has a reasonably efficient conservancy system, spends Rs. 2-8 per head of population on conservancy, and has an incidence of taxation per head of population of Rs. 3-7-7. Sylhet, with a larger population and a most inefficient conservancy system, spends only 9 as. 11 ps. per head of population, and has an incidence of taxation per head of population of Re. 1-12.

At present, public opinion has not yet been educated up to the realisation of the importance of this question. The natural tendency of most people is to avoid the subject as one which has unpleasant and unsavoury associations. Thus, while public opinion in general is now prepared to accept an increase in taxation for the provision of a water-supply and to work with no little enthusiasm towards the realisation of such a project, no such feeling as yet exists in favour of conservancy reforms. There is a tendency to consider that the beginning and the end of all sanitary reform is the provision of a pipe water-supply and to attain this, municipalities are prepared to pledge the whole of their credit for the next 20 years, thereby rendering impossible expenditure upon other matters, such as conservancy, in which reform is urgently required.



By fixing the minimum standard of efficiency and of expenditure on conservancy which can be accepted as satisfactory, and by endeavouring to induce municipalities to work up to this standard, a much needed reform will be initiated.

In most of the municipalities of any size, water-supply schemes are under consideration. In fixing the financial basis upon which such schemes are to be evolved, it may be considered whether it is wise to allow the smaller towns to pledge almost the whole of their surplus revenues towards the repayment of loan charges during the ensuing 20 years, as, owing to the smallness of the population and the small rateable value of the town, their revenues are necessarily small and inelastic, and it may, therefore, be considered whether it would not ultimately be sounder policy to make a free gift of the capital cost of such water-supply schemes on the condition that the towns raise their taxation to the maximum permissible limits and devote the surplus so obtained to financing, under the advice of the Sanitary Board, the necessary major and minor reforms of smaller capital cost, which must either be postponed until the termination of the period of loan service, or be carried out by a frequent series of doles from Government, a system which is destructive to the spirit of self-help, which the system of local self-government is intended to foster.

The financial position of many of the small towns of Assam is not the same as that of the large and more wealthy towns of India, and they seem to require more generous treatment by Government, than would be legitimate elsewhere.

The subjoined table shows the total municipal expenditure on sanitary purposes during the year 1913 as compared with that of the preceding year:—

Head of expenditure.	Total expenditure.		Difference	
	1913.	1912.	Increase.	Decrease.
1	2	3	4	5
	Rs.	Rs.	Rs.	Rs.
1. Conservancy, including establishment, road-watering, latrines, etc.	1,18,983	1,11,763	7,221	.....
2. Drainage ... ..	13,137	11,585	1,553	.....
3. Water-supply ... ..	73,153	2,23,529	.....	1,50,377
4. Disposal of the dead ... ..	119	133	.....	13
5. Market and slaughter-houses ... ..	12,208	8,530	3,678	.....
6. Treatment of the sick ... ..	16,105	11,136	4,967	.....
7. Vaccination ... ..	1,105	1,160	.....	55
8. Other sanitary works ... ..	2,424	11,174	.....	7,680
<b>Total ...</b>	<b>32,8,302</b>	<b>2,79,008</b>	<b>17,418</b>	<b>1,58,124</b>
9. Construction and maintenance of road ...	66,467	64,859	1,608	.....
<b>Total including roads ...</b>	<b>3,04,769</b>	<b>4,42,907</b>	<b>13,986</b>	<b>1,58,124</b>

31. *Sanitary works.*—The statement below shows the distribution of grants during 1913-14 out of Rs. 2,25,000 provided for sanitary improvements.—

	Rs.
Grant to Silchar Municipality for reorganisation of the conservancy system.	5,500
Grant to Nowgong Municipality for improvement of conservancy and sanitation.	4,000
Additional grant to Shillong Municipality for complete overhauling of Shillong water-works.	15,154
Grants for village road ... ..	4,000
"    "    "    sanitation ... ..	8,000
Grant to Shillong Municipality for Jhalupara Water-supply ...	102



	Rs.
Sanitary improvement of Haflong station	12,893
Uniting two lakes at Haflong	4,480
Construction of a regulating sluice on the Bogdoi at Jorhat	2,341
Grant to Shillong Municipality for improvement of Dhubighat	290
Training of Sanitary Inspectors	3,840
Construction of a cholera hospital at Dhubri	17,153
Grant to Gauhati Municipality for the improvement of the tank at Gauhati.	4,938
Additional grant for Jorhat Water-works scheme	4,599
Improvement of certain 'Holas' in Tezpur	1,000
Water-supply scheme for North-East Frontier	2,000
Metering house connections in Gauhati	11,060
Additional grant for clearing jungles, etc., at Nongp h	260
Total	1,01,610

#### SURMA VALLEY DIVISION.

*Cachar*.—Administrative approval was accorded in 1912-13 to the rough project for a water-works scheme for the town of Silchar at a cost of Rs. 1,16,658. Detailed plans and estimates have been prepared by the Chief Engineer, and these have exceeded the rough estimates by Rs. 16,110. A report of the Divisional Commissioner as to how the municipality proposes to meet the recurring charges is awaited and sanction of the detailed estimates is awaiting a settlement of this question.

The conservancy arrangements of the town have been thoroughly revised. The former method of disposal of night soil by incineration proved unsatisfactory. Fuel for incineration had to be purchased at considerable expense, and the process of mixing prior to incineration, was attended with nuisance and smell, and the whole process on account of the difficulties involved appeared to put a premium upon the collection of as small an amount of nightsoil as possible. Accordingly removal plant and 40 bighas of land for trenching has been acquired. One twelve-seated Donaldson's patent public latrine has been purchased. The total cost of the change, *vis.*, Rs. 5,500, has been made by a grant from Government.

*Sylhet*.—A rough project for a pipe water-supply for the town of Sylhet has been prepared by Messrs. James Simpson & Co. at a cost of Rs. 2,50,000.

The estimates have been checked by the Chief Engineer, and he has proposed certain alterations, by which the estimates might be reduced to Rs. 2,00,000. The revised rough project was submitted to Government through the Sanitary Board for administrative approval, suggesting that half the cost may be met by a Government grant, and the remainder may be met by the municipality by taking a loan of Rs. 1,00,000 from Government. Various suggestions have been made by the municipality as to how the maintenance charges, which have been estimated to cost Rs. 12,000, and the annual charges of Rs. 8,000 on account of the repayment of the loan in 20 years, can be met. They have been examined, and none of them have as yet been found to be financially sound.

The conservancy arrangements of the town are unsatisfactory. An estimate of Rs. 19,200 has been prepared to effect an improvement, of which Rs. 16,200 has been asked from Government as a grant and the balance, Rs. 3,000, is to be provided by the municipality from its budget for 1914-15. The conservancy arrangements of this town are most inadequate and the question of their improvement is an urgent one.

A new municipality has been constituted at Karimganj during the year, and a scheme for town planning has been prepared costing Rs. 78,690. It provides for (a) the construction of two circular roads, (b) improvement of water-supply by excavation of the three new tanks, protecting these and the existing tanks from contamination by fencing and providing water-lifts according to one of the type plans approved by the Sanitary Board, (c) improvement of the conservancy system by constructing 4 eight-seated latrines and acquiring 6 bighas of land for a new trenching ground, and (d) construction of a new municipal market and providing drains for the bazar. The details of the scheme are now under preparation by the Sanitary Board.



## ASSAM VALLEY.

*Dhubri.*—The original scheme of improving the water-supply of the town of Dhubri by protected wells has been replaced by a rough project, amounting to Rs. 55,450, for a pipe water-supply. The result of a boring has shown that a pure and plentiful supply of water is available under sub-artesian conditions from a deep well. The water has been found to be chemically pure and it will require no filtration. It is proposed to finance the scheme by a grant of Rs. 28,44 from Government, by private donations to the extent of Rs. 19,701, and by providing Rs. 7,505 from the King Edward Memorial Fund. The work will be designated the King Edward Memorial Water-works. The annual maintenance charges have been estimated to cost Rs. 4,608, which can be met from a water rate. Detailed plans and estimates are being prepared.

As Dhubri is the first port of call in Assam for the daily service of river steamers carrying a large number of passengers and labour immigrants for the industries of the province, it was considered advisable to provide an infectious diseases hospital of permanent construction at this port, and this is now under construction.

A scheme for improving the surface drainage of the town of Goalpara is now under investigation by the Public Works Department.

*Kamrup.*—A sum of Rs. 16,500 for adding a new filter-bed and clear-water reservoir with additional storage tanks for increasing the pressure and supply of water in the mains in certain areas of the town of Gauhati, has been spent on the recommendations of a conference in Gauhati of officials and non-officials called by the Chief Commissioner. A grant of Rs. 11,060 has also been made for the provision of meters on all private house connections. The effect of these reforms has been very satisfactory in providing a more adequate supply of water and by checking wanton waste of water in private houses.

Estimates are being prepared for (a) a general drainage scheme of the town and (b) for *pucca* drains for the quarter of the town known as Kayapatti. Plans and estimates for a municipal slaughter-house are under preparation by the municipality. With regard to the many insanitary tanks in the town, it is considered that, as there is a pipe water-supply, the question of providing these tanks with sufficient protection as a sanitary water-supply does not arise. The Dighli Pukri is the biggest of these tanks. A grant of Rs. 4,938 has been made to the Gauhati Municipality for clearing the tank of weeds and keeping it in a sanitary condition. It has been suggested to the municipality that the remaining tanks should be gradually filled up and eventually made available as building sites, and that the proceeds of the sale, or letting of these sites, might be made to pay for some part of the initial cost of the scheme.

A report on the drainage of the town of Barpeta was furnished by the Public Works Department. No serious defect in the drainage system was discovered, which, on account of the levels of the town and its surrounding, cannot be materially improved.

*Darrang.*—A rough project at an estimated cost of Rs. 1,00,000 for a pipe water-supply for the town of Tezpur has been prepared by the Public Works Department and submitted to Government for administrative approval. It has been proposed that two-thirds of the capital cost may be met by a grant from Government and the remaining one-third by a loan. The annual maintenance charges and the annual charges for the repayment of the loan will be about Rs. 10,750. The proposal submitted by the municipality as to how these charges should be met were not considered to be financially sound and they have been asked to submit revised proposals.

A project costing Rs. 3,229 for the improvement of the town by filling up hollows and depressions has been sanctioned and a grant of Rs. 1,000 as Government contribution has been made to the municipality.

A rough project amounting to Rs. 8,000 for the construction of a 8-foot diameter well, and for pumping the water by an oil engine and supplying the town of Mangaldai with water by pipe distribution has been prepared and submitted to Government for administrative approval. The entire capital cost will have to be met by a Government grant. If the Town Fund cannot meet the maintenance charges, an alternative scheme for sinking three 4-foot diameter wells to the requisite depth will presumably have to be substituted. The capital cost will be the same, but the maintenance charges will be Rs. 100 only, which the Town Fund can provide. A survey is being made in connection with the drainage scheme of the town.



*Nowgong*.—A grant of Rs. 4,000 was made to the Nowgong Municipality for the improvement of sanitation and conservancy. Six tube wells have been sunk and one masonry well has been constructed and another is in process of construction. Two night-soil carts and a pair of bullocks have been purchased and added to the conservancy plant.

A project at a cost of Rs. 5,380 was prepared for providing sluice gates on the Nazirjan and Dhepajan to keep flood water from entering the town, but it was abandoned. The cross bunding of Nazirjan has been made at a cost of Rs. 830 as an experiment.

*Sibsagar*.—The water-works for the town of Jorhat are approaching completion. An additional grant of Rs. 4,599 has been made during the year. A project for improving the condition of a stream called the Tokloi, flowing through the town, amounting to Rs. 2,341 has been sanctioned and is approaching completion.

Revised estimates amounting to Rs. 28,338 have been prepared during the year under report for improving the water-supply of the town of Golaghat by the excavation of a drinking water tank, which is to be provided with adequate means of protection. The revised estimates have exceeded the rough estimates by Rs. 5,377 and this is being met from the current year's budget. The work is now in progress.

A project amounting to Rs. 879 for draining the town of Golaghat has been prepared and submitted to Government for sanction. There are certain low-lying undrained areas in the town, which it is proposed to link up with one or the other of the main surface drains.

A project amounting to Rs. 14,405 for improving the water-supply in the town of Nazira by means of two protected tanks is being revised in consultation with the local authorities.

*Lakhimpur*.—An estimate for a pipe water-supply for the town of Dibrugarh is under preparation. A boring was made and the water obtained from it has been found, on analysis, to be chemically pure and potable. The special Public Works officer for sanitary schemes has lately made recuperation tests on the borings, and as these have proved satisfactory, a rough project amounting to Rs. 1,66,000 has been prepared by him.

A combined drainage and town improvement project for the town of Dibrugarh, amounting to Rs. 76,606, has been prepared by the Public Works Department. The question as to how it should be financed is now engaging attention. Estimates amounting to Rs. 7,771 for purchasing additional conservancy plant have been prepared by the municipality and submitted to this office. The municipality has provided Rs. 4,000 in its budget and applied for a grant of the balance, thereby giving a lead in an appreciation of the importance of conservancy reform, which may, with advantage, be followed elsewhere. The local butchers have been induced to build cleanly fly-proof slaughter-houses, and the meat-supply of the town has now been placed upon a more satisfactory footing than formerly.

#### HILL DISTRICTS.

*Khasi and Jaintia Hills*.—The original estimates for overhauling the Shillong Water-works have been exceeded by Rs. 9,499. The work has been completed during the year. Regular analyses performed in the Provincial Laboratory show the exceptional purity of this water.

The incomplete Dhobighat has been completed. Shelter sheds, drying sheds and drying greens have been provided. The original estimates have been exceeded by Rs. 230.

An additional grant of Rs. 180 has been made for completing the experimental septic tank latrine at Shillong, and of Rs. 260 for complete clearance of jungle at Nongpoh within an wider area than was originally proposed.

A rough project for providing a sewerage system for Shillong has been prepared and submitted to Government. The project owes its inception to a recommendation made by the Sanitary Commissioner with the Government of India when he visited the station in 1909, to the effect that a water carriage of sewage by under-ground sewers should be introduced in Shillong. The whole scheme is estimated to cost eleven lakhs of rupees, and it is so framed that sections complete in themselves could be taken up seriatim as funds permit. The special Public Works Department officer is studying the methods adopted in other hill stations by which difficulties inherent in such systems are obviated. The scheme represents an important and necessary reform, which should be taken up when funds are available.



A rough project amounting to Rs. 11,562 for improving the water-supply at Cherrapoonjee has been prepared and submitted to Government for administrative approval. This town, which is on the direct route between the capital of the province and the Surma Valley Division, has suffered from outbreaks of cholera owing to pollution of its water-supply by travellers, and it is thought that an improvement of its water-supply will lessen the risk of the spread of cholera through the Khasi Hills by the disease being imported from the endemic areas in the plains and gaining a footing in Cherrapoonjee.

*North Cachar Hills.*—A sum of Rs. 4,440, which was placed at the disposal of the Subdivisional Officer, North Cachar Hills, for clearing jungle in the town of Haflong in March 1913 has been expended in 1913-14. A sum of Rs. 5,395 was also placed at his disposal in September 1913 for re-grading the surface drains in the town, but the progress of the work was retarded by scarcity of labour. The amount spent up to date has not yet been reported.

An estimate amounting to Rs. 4,480 for uniting the two lakes has been sanctioned.

*Local Board expenditure on sanitation.*—The nineteen Local Boards in the province incurred an aggregate expenditure of Rs. 89,397 on rural water-supply and other minor schemes of village sanitation. As in the preceding year, the largest sums were spent by the Gauhati and the Barpeta Local Boards, where comprehensive schemes of water-supply are in progress.

An expenditure of Rs. 1,73,169 is reported to have been incurred by the Public Works Department on sanitary works during the year under report against Rs. 1,53,988 of the previous year.

## SECTION X.

### GENERAL REMARKS.

32. *Village sanitation.*—Measures undertaken by the Sanitary Board:—

As in the previous year, a sum of Rs. 40,000 was distributed as grants-in-aid to different Local Boards towards the improvement of rural water-supply. In addition to this, a grant of Rs. 10,000 was made by the Local Administration to each Local Board, the total amounting to Rs. 1,90,000.

The Sanitary Board grant was distributed as follows:—

#### SURMA VALLEY DIVISION.

	Rs.
North Sylhet Local Board	6,960
South Sylhet " "	350
Habiganj " "	450
Karimganj " "	3,115
Hailakandi " "	666
Total	11,541

#### ASSAM VALLEY DIVISION.

Gauhati Local Board	5,438
Barpeta " "	8,691
Goalpara " "	1,436
Mangaldai " "	5,000
Nowgong " "	1,168
Jorhat " "	3,000
Golaghat " "	323
Dibrugarh " "	1,873
North Lakhimpur Local Board	1,500
Total	28,459

*Gauhati subdivision.*—The scheme for the improvement of the rural water-supply in the subdivision of Gauhati completed its fifth and last financial year in 1912-13. Eighteen tanks which were reported to be in progress in 1912-13 have been completed during the year under report. The construction of one new well and the re-excavation of a silted up river bed called the Hajo-Sota has been completed and work on 10 tanks is now in progress.



*Barpeta subdivision.*—A similar scheme for the subdivision of Barpeta completed its fifth financial year in 1913-14. Five wells and 12 tanks have been completed during the year and 17 wells and 1 tank are reported to be in progress.

*Mangaldai subdivision.*—This scheme has been started on the same lines as the Gauhati and Barpeta schemes. It was sanctioned at the end of the cold weather of 1912-13. Five tanks have been completed and 18 tanks and 3 wells are in progress.

Similar schemes are in course of preparation for each subdivision in the province as a result of a conference of officials and representatives of the local bodies and of the public called by the Chief Commissioner.

The village sanitation scheme which was introduced as an experiment in 1912-13 was in progress during the year under report. A grant of Rs. 4,000 was made to each Commissioner for making small grants to selected villages. The object of the grant is to stimulate the interest of villagers in village improvements and to educate them in measures of Local Self-Government by means of village organisations. During the first year of the experiment much attention was paid to the improvement of village roads and paths, and it has been pointed out that purely sanitary improvements should not be overlooked. It seems desirable that Commissioners of Divisions should report to this office the names and situations of the villages in each district in which this experiment is in operation, so that its results may, without any formality of inspection or control, be to some extent under the observation of this department.

33. *Sale of quinine.*—The subjoined table shows the progress made in the sale of quinine during the year under report compared with that of the previous year:—

District.	Treatment parcels sold in		Difference.	
	1913.	1912.	Increase.	Decrease.
1	2	3	4	5
Cachar ... ..	495	438	57	...
Sylhet ... ..	1,636	1,130	506	...
Khasi and Jaintia Hills ... ..	903	1,001	...	98
Naga Hills ... ..	150	...	150	...
Lushai Hills ... ..	151	59	92	...
Goalpara ... ..	1,099	576	523	...
Kamrup ... ..	657	629	58	...
Darrang ... ..	682	527	155	...
Nowgong ... ..	1,224	797	427	...
Sibsagar ... ..	463	265	198	...
Lakhimpur ... ..	704	600	104	...
Total ... ..	8,194	6,022	2,270	98

There was an increase in the sale in every district except Khasi and Jaintia Hills. The sale of quinine, on the treatment system, continues to increase in popularity and the value of the drug as a remedy for malaria is slowly but surely becoming known. Three whole-time special vendors, one in each of the districts of Cachar, Sibsaagar and Kamrup, have been appointed for one year, as an experiment. The vendor, who has been specially selected by the Civil Surgeon, receives a subsistence allowance of Rs. 10 a month and he is allowed to retain the usual commission of 7 annas per parcel sold. He is supplied with as many packages of quinine treatments as he can sell during each of his tours, which are so arranged as to include all 'hats' and 'melas' in the district, and with copies of vernacular leaflets for distribution, stating that 'quinine cures malarial fever, but no other kind of fever, it can be bought from the vendor or from the post offices for 3 annas per tube.' The results of the scheme are not yet available, and as it has not yet passed through a year of its life, including the fever season of the year, it is too soon to comment on its success.



Arrangements have been made with a firm in Calcutta for the reproduction of a quinine advertisement poster of an attractive design, provided by an indigenous artist, which is being printed on enamelled iron plates of durable composition. These pictures, like the enamelled iron advertisement plates familiar in the railway stations of Europe, will be practically weather-proof.

The Postmaster General reports that "the sale of treatments of quinine through the agency of post offices during the year 1913 has exceeded that of the preceding year by 13,539 treatments. The increase in the sale of the treatments of quinine may be attributed to the appreciation of the greater efficacy of the new treatment.

"The requisition from postal vendors for fresh supplies of quinine appear to have been promptly complied with.

"During the year under review there was no case either of defalcation or of smuggling of quinine on the part of any postal vendor, nor was there any instance of loss of any parcel of treatments in course of transmission through the post."

34. *Pilgrim traffic*.—There is no important centre of pilgrim traffic in this province.

The Sidheswari *mela* at Katigora in the Cachar district takes place between 15th March and 10th April every year during "*Baruni-Snan*" a Hindu festival. It lasts for a fortnight and the number of people attending the *mela* is about 15,000. The Civil Surgeon, Cachar, was requested to direct the Sub-Assistant Surgeon of the Katigora dispensary to look after the sanitary arrangements of the *mela*.

35. *Railway Coolie camps*.—The Fenchuganj-Sylhet branch of the Assam-Bengal Railway was in progress during the year. On this branch there were two large camps numbering 1,000 coolies in connection with the construction of a bridge on the north and south banks of the river Kushiara. The drinking water was drawn from the river and passed through a Jewel filter for the camp on the north bank, while the camp on the south was supplied with drinking water from a reserved tank. Latrines and trenching grounds were provided, and a staff of 19 sweepers was entertained. One Hospital Assistant with a compounder was in charge of the medical and sanitary arrangements. Five deaths from accidental causes and 42 cases of cholera with 22 deaths were reported.

No branches of the Eastern Bengal State Railway were under construction in the province of Assam during the year 1913.

36. *Provincial Laboratory*.—The work of the Provincial Public Health Laboratory during the year was performed by Assistant Surgeon Ram Taran Sen, L.M.S., under the supervision of the Deputy Sanitary Commissioner. The work of the Laboratory shows a considerable increase during the year under review (*vide* table sub-joined):—

	1912.	1913.
Chemical analysis of water ... ..	50	97
Examination of ghee, fats and oils ... ..	...	11
"    "    milk ... ..	20	31
"    "    other food stuffs ... ..	...	2
"    "    uripe ... ..	...	24
"    "    stools ... ..	...	7
"    "    intestinal parasites ... ..	...	1
Bacteriological examination of water ... ..	...	84
"    "    blood films ... ..	3	124
"    "    Splenic and hepatic smears ... ..	...	3
"    "    pus and other discharges ... ..	...	5
"    "    sputa ... ..	14	27
"    "    throat swabs for diphtheria ... ..	...	6
"    "    agglutination test ... ..	2	15
Blood count and colour index ... ..	...	8
Section cutting for identification of tumours ... ..	...	1
Vaccine ... ..	...	1
Silt analysis ... ..	...	362
Total ... ..	89	773

A special feature of the year was a series of 362 analyses of samples of water sent by the Public Works Department from various parts of the province, to determine the amount of silt carried by these waters. As the subject is one of some current



interest with reference to the possibility of making use of the Italian system of *Bonificazione* as an anti-malarial measure in India, the figures will be published in the Supplement to the Sanitary Report.

Regular weekly chemical and bacteriological analysis of the Shillong tap water were carried out. As these show the regularity with which certain lactose-fermenting organisms of the so-called "faecal bacilli" type are to be found in a water which is neither polluted, nor by any practical possibility pollutable, these figures will also appear in the supplement to this report.

The Laboratory is prepared to undertake all ordinary analyses required in connection with public health work. Circulars were re-issued to Civil Surgeons and to medical officers of tea estates, calling attention to the facilities for obtaining such analyses from the Laboratory. The Deputy Sanitary Commissioner records his appreciation of the care and accuracy with which the officer in charge of the Laboratory, Assistant Surgeon Ram Taran Sen, has performed his technical duties.

37. *Emigration*.—During the year under report the total number of emigrants passed through Goalundo to the labour districts of Assam was 53,963.

These were despatched by the following routes :—

To the Assam Valley by steamer ... ..	23,317
To the Assam Valley by rail <i>via</i> Chandpur ... ..	22,369
To Cachar and Sylhet by steamer... ..	30
To Cachar and Sylhet by rail <i>via</i> Chandpur ... ..	8,247

The health of the emigrants was good at Goalundo: 5 cases of infectious diseases were admitted into Goalundo hospital, *viz.*, 4 from cholera and 1 from small-pox, of which three cholera cases ended fatally. Sixteen deaths (13 from cholera and 3 from other diseases or causes) were reported on steamers. The Sanitary Commissioner, who is a Superintendent of Emigration under the Emigration Act, is aided in the control of this important branch of work by a Military Assistant Surgeon, who, as Travelling Inspector of Emigrants, supervises the details of the arrangements by which the health of the large number of labour immigrants to the province is safe-guarded.

The Sanitary Department through the Travelling Inspector of Emigrants has now to supervise the steamer route between Goalundo and Dibrugarh, the Eastern Bengal State Railway route between Saraghat and Amingaon and the Assam-Bengal Railway route between Chandpur and Dibrugarh. The headquarters of the Travelling Inspector of Emigrants at Dhubri are inconveniently situated with regard to the railway routes. If his headquarters were removed to Gauhati, he would be equally conveniently situated for supervising the steamer route, and have more easy access to both the railway routes, and he would be more readily in touch with the Sanitary Commissioner.

The office of the Travelling Inspector of Emigrants was held by Mr. Blinkworth from 1st January 1913 to 6th December 1913, and by Mr. Munrowd from 7th December 1913 to 31st December 1913.

38. *Personal proceedings*.—Since the reconstitution of Assam as a separate province, the experience of the Administration of the three departments of Civil Hospitals, Jails and Sanitation as a unified charge has shown that it is not possible for me to take an active part in the operations of the Sanitary Department, nor to exercise more than a general supervision over the more important items of its work.

In view of the large increase in the activities of this Department which has taken place in response to the growth of popular interest in sanitation and as the result of the increased grants under this heading which have of late been sanctioned by the Government of India, it appears desirable that the Sanitary Commissioner should be free to devote the whole of his time and energies to the work of this important progressive Department. For these reasons, proposals are being submitted to the Local Administration for the separation of the Sanitary Department from my charge, and its constitution as a separate charge under a whole-time Sanitary Commissioner, on arrangements similar to those in force in the Central Provinces.

Major T. C. McCombie Young, I.M.S., the Deputy Sanitary Commissioner, who is a keen and energetic officer, has done excellent work during the year, and I consider his services deserve special mention in the report.

*Deputy Sanitary Commissioner*.—In the month of January the measures for the control of *kala-azar* in the Golaghat subdivision were inspected in company with Major Mackie, I.M.S., *Kala-azar* Research Officer. From there, a tour along the South Trunk Road to Nowgong, inspecting the *kala-azar* survey and vaccination operations, was made and the municipality of Nowgong was inspected.



In February the inspection of the *kala-azar* survey in the Nowgong district was completed and similar work was commenced in the Goalpara subdivision on the south bank of the Brahmaputra. The town of Goalpara was visited and inspected and the *kala-azar* survey and vaccination operations in the Goalpara subdivision were inspected. The Tezpur subdivision was visited for a similar purpose and the municipality of Tezpur inspected.

In March the town of Mangaldai was visited and inspected and a tour through the subdivision to inspect the *kala-azar* survey and vaccination operations was carried out.

The adjoining portion of the Kamrup district on the north bank was then traversed for a similar purpose, and a visit of two days' duration was paid to Shillong in connection with the preparation of the budget speech. The inspection of the *kala-azar* survey in the Gauhati subdivision was then completed. The Indian Medical Service conference in Gauhati was attended and a visit was paid by launch to a village on the Brahmaputra, from which a number of *kala-azar* cases had been reported.

A tour of inspection of the emigration arrangements was made to Dibrugarh by steamer, returning by rail, accompanied by the Travelling Inspector of Emigrants.

During April the Dhubri subdivision was visited, and further work in connection with the *kala-azar* survey was performed in the Goalpara district.

During May the sanitation of Shillong was examined in detail, reports were drawn up, and short tours of vaccination inspection in the Khasi and Jaintia Hills were performed.

During June Cherrapunjee was visited in connection with a water-works scheme, and the monsoon tour was commenced.

During July the municipality of Gauhati, the station of Sibsagar, and the municipality of Dibrugarh were visited. *Kala-azar* survey work at Silghat was inspected, and the municipality of Barpeta visited.

During August, a tour by launch in the Sylhet district was carried out to inspect the *kala-azar* survey and vaccination operations in that district. The municipality and subdivision of Sunamganj was visited.

Baniachang, Lakhai, Ajmiriganj, Maulvi Bazar and Habiganj thanas were visited. The thanas and municipalities of Karimganj and Sylhet were visited and inspected, and a flying visit was paid to Gauhati.

The months of September and October were spent at headquarters in performance of the office work of the Department and Sanitary Board, and in supervising the work of the Provincial Laboratory.

In November, touring was recommenced. Inspection of the *kala-azar* survey in Kamrup was resumed, and the municipality of Gauhati was inspected.

In December a tour along the north bank of the Brahmaputra through the Kamrup district and Dhubri subdivision of Goalpara for the purpose of inspecting the *kala-azar* survey, rural water supply and vaccination in these areas was carried out, and the municipality of Dhubri was visited and inspected.

H. E. BANATVALA, *Lieut.-Colonel, I.M.S.*,

*Offg. Sanitary Commissioner, Assam.*



## SECTION XI.

## ANNUAL REPORT OF THE SANITARY BOARD.

39. There was no change in the constitution of the Provincial Sanitary Board during the year under report.

It is formed as below :—

The Inspector General of Civil Hospitals, Assam	...	...	<i>President.</i>
Chief Engineer	}	...	...
Divisional Commissioners			
The Deputy Sanitary Commissioner	...	...	<i>Secretary.</i>

Three meetings of the Sanitary Board were held during the year. A large portion of the work of the Sanitary Board is transacted by circulation of files on account of the difficulty of arranging for meetings when the members of the Board are on tour.

The function of the Board is for the most part advisory. All major projects for sanitary works pass through the Board, which forwards them to Government with an expression of its opinion as to their merits, and therefore no separate lengthy report on the business of the Sanitary Board, as apart from the working of the Sanitary Department, need be submitted.

The Board's grant for distribution in aid of rural water-supplies was allotted as noted under paragraph 32. This grant will not, in future, be placed at the disposal of the Board.

The most important question before the Board during the year under review was the formulation, at the request of the Local Administration, of a comprehensive general scheme for the improvement of the rural water-supply. Type plans and instructions for the construction of tanks and wells were drawn up by the Sanitary Board and issued to all local authorities. These plans prescribe the various types of constructions which will be approved for work undertaken under this scheme. Care has been taken to provide for an adequate and durable system of protection against pollution, both in wells and in tanks. The cost of following this scheme of protection, and the consequent limitation of the scope and rapidity of progress of the project, has been the subject of careful consideration. As it appeared that no less expensive methods of protection would prove efficient, the sanitary advisers of Government were faced with the alternatives, either of recommending that no system of mechanical protection should be attempted and that only unprotected wells and tanks should be provided, or that an effort should be made to provide adequately protected tanks and wells in all constructions undertaken under this scheme. It was considered that, although many years must elapse, and a large sum of money must be expended before the benefits from the latter scheme can be widely distributed, yet, on account of the greater ultimate value of the scheme and of its present educational influence, the scheme providing for adequate protection should be adopted.

The appointment of Mr. A. T. Duguid as special officer under the Public Works Department for dealing with sanitary schemes has enabled the Board to make greater progress in the preparation of its projects for water-supply and drainage. The creation of the post of Sanitary Engineer is, it is understood, under reference to the Government of India.

Most of the schemes of the Board have now advanced through the technical and departmental phases of their existence and are now, prior to maturation, passing through a stage of reconstruction on a sound financial basis. The disappointing slowness with which these schemes materialise in brick and mortar is partly due to the delays inseparable from the machinery of Indian administration, and also to the difficulty with which Assam municipalities with their small populations and small rateable value can raise money for repayment of loans without crippling their resources and curtailing their activities in other important directions.

A list of schemes under the consideration of the Sanitary Board on the termination of the year is subjoined :—

Water-supply scheme for the town of Silchar.		
Ditto	ditto	Dibrugarh.
Ditto	ditto	Sylhet.
Ditto	ditto	Nazira.
Ditto	ditto	Mangaldai.
Ditto	ditto	Tezpur.
Ditto	ditto	Dhubri.
Ditto	ditto	Cherrapoonji.



Drainage and town improvement scheme of Dibrugarh.

Drainage scheme for the town of Gauhati.

Ditto ditto Golaghat.

Ditto ditto Mangaldai.

Conservancy scheme for the town of Sylhet.

Ditto ditto Dibrugarh.

Town planning scheme for the town of Karimganj.

Rural water-supply scheme for each subdivision.

Malaria Research scheme.

Shillong Sewerage scheme.

**T. C. McCOMBIE YOUNG, Major, I.M.S.,**

*Secretary, Sanitary Board, and Deputy Sanitary Commissioner, Assam*



Statement of the

Name of the		Date		Place	
No.	Name	Month	Year	City	State
1	...	...	...	...	...
2	...	...	...	...	...
3	...	...	...	...	...
4	...	...	...	...	...
5	...	...	...	...	...
6	...	...	...	...	...
7	...	...	...	...	...
8	...	...	...	...	...
9	...	...	...	...	...
10	...	...	...	...	...

### STATEMENTS.

No.	Name	Month	Year	City	State
1	...	...	...	...	...
2	...	...	...	...	...
3	...	...	...	...	...
4	...	...	...	...	...
5	...	...	...	...	...
6	...	...	...	...	...
7	...	...	...	...	...
8	...	...	...	...	...
9	...	...	...	...	...
10	...	...	...	...	...



## IMPERIAL STATEMENT No. I.—Statement showing the births

Number.	District.	Population according to the Census of 1911.			Number of births registered.		
		Male.	Female.	Total.	Male.	Female.	Total.
1	2	3	4	5	6	7	8
<b>SURMA VALLEY.</b>							
1	Cachar ... ..	246,205	223,962	470,167	7,644	7,345	14,989
2	Sylhet ... ..	1,268,469	1,204,202	2,472,671	42,525	39,028	81,553
	Total ... ..	1,514,674	1,428,164	2,942,838	50,169	46,373	96,542
<b>ASSAM VALLEY.</b>							
3	Goalpara ... ..	318,475	282,168	600,643	12,445	11,690	24,135
4	Kamrup ... ..	339,398	328,430	667,828	10,229	9,510	19,739
5	Darrang ... ..	198,581	178,733	377,314	6,876	6,576	13,452
6	Nowgong ... ..	154,938	148,658	303,596	4,706	4,543	9,249
7	Sibsagar ... ..	364,810	325,489	690,299	12,033	11,215	23,248
8	Lakhimpur ... ..	249,021	219,968	468,989	6,965	6,745	13,710
	Total ... ..	1,625,223	1,483,446	3,108,669	53,254	50,279	103,533
	Total for the Province ... ..	3,139,897	2,911,610	6,051,507	103,423	96,652	200,075

## IMPERIAL STATEMENT No. II.—Statement showing the births and deaths

Number.	District.	Area, in square miles.	Average population per square mile.	Population (Census 1911).			Births.		Number of deaths registered.		
				Male.	Female.	Total.	Total number.	Births per 1,000 of population.	Male.	Female.	Total.
1	2	3	4	5	6	7	8	9	10	11	12
<b>SURMA VALLEY.</b>											
1	Cachar ... ..	3,565	182	246,205	223,962	470,167	14,989	31.83	6,786	5,938	12,744
2	Sylhet ... ..	5,338	458	1,268,469	1,204,202	2,472,671	81,553	32.98	38,571	34,662	73,433
	Total ... ..	8,903	328	1,514,674	1,428,164	2,942,838	96,542	32.80	45,357	41,870	86,177
<b>ASSAM VALLEY.</b>											
3	Goalpara ... ..	2,954	151	318,475	282,168	600,643	24,135	40.17	10,953	9,350	20,302
4	Kamrup ... ..	3,838	173	339,398	328,430	667,828	19,739	29.55	8,245	7,277	15,522
5	Darrang ... ..	3,418	110	198,581	178,733	377,314	13,452	35.65	6,306	5,945	12,341
6	Nowgong ... ..	3,843	79	154,938	148,658	303,596	9,249	30.46	3,904	3,623	7,527
7	Sibsagar ... ..	4,906	133	364,810	325,489	690,299	23,248	33.68	7,441	6,988	14,429
8	Lakhimpur ... ..	4,329	103	249,021	219,968	468,989	13,710	29.23	5,811	5,270	11,081
	Total ... ..	24,508	126	1,625,223	1,483,446	3,108,669	103,533	33.39	42,749	38,453	81,202
	Total for the Province ... ..	33,551	159	3,139,897	2,911,610	6,051,507	200,075	33.66	88,106	79,273	167,379



registered in the districts of Assam during the year 1913.

Ratio of births per 1,000 of population.			Number of mal + born to every 100 females born.	Excess of births over deaths per 1,000 of popu- lation.	Excess of deaths over births per 1,000 of popu- lation.	Mean ratio of births per 1,000 during previous five years.		
Male.	Female.	Total.				Male.	Female.	Total.
9	10	11	12	13	14	15	16	17
16.25	15.62	31.88	104	4.78	...	16.82	15.76	32.58
17.19	15.78	32.98	108	3.29	...	17.08	15.71	32.79
17.04	15.75	32.80	108	3.52	...	17.03	15.72	32.76
20.71	19.46	40.17	106	6.37	...	19.85	18.34	38.69
16.31	14.24	29.55	107	6.31	...	16.37	15.15	31.63
18.22	17.42	35.65	104	2.95	...	16.65	15.97	32.62
15.50	14.96	30.46	103	5.67	...	15.87	15.13	31.00
17.43	16.24	33.68	107	12.78	...	14.37	13.34	27.71
14.85	14.38	29.23	103	5.61	...	13.91	12.13	27.04
17.13	16.17	33.30	105	7.18	...	16.21	15.26	31.47
17.09	15.97	33.06	107	5.40	...	16.61	15.48	32.09

registered in the districts of Assam during the year 1913.

Number of deaths of males to every 100 deaths of females.	Deaths per 1,000 of population from—											Mean ratio of deaths per 1,000 during the previous five years.		
	Cholera.	Small-pox.	Plague.	Fever.	Dysentery and Diarrhoea.	Respiratory diseases.	Injuries.	All other causes.	All causes.			Male.	Female.	Total.
									Male.	Female.	Total.			
13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
113	3.59	.006	...	11.85	3.37	.67	.34	7.34	27.56	26.60	27.10	25.52	25.79	25.65
110	3.76	.47	...	12.45	2.99	.64	.36	8.29	30.40	28.95	29.69	26.78	25.71	26.25
111	3.72	.39	...	12.55	3.05	.64	.36	8.73	29.94	28.58	29.28	26.57	25.73	26.16
117	.81	.59	...	22.30	.37	.12	.35	2.33	34.38	33.13	33.80	30.89	32.80	31.79
113	4.21	1.02	...	13.85	.70	.28	.28	2.87	24.26	22.15	23.24	26.65	25.91	26.28
107	1.37	.89	...	16.30	3.56	1.29	.34	6.99	32.23	33.26	32.70	36.62	36.55	37.53
107	3.09	.48	...	15.57	1.51	.19	.22	3.63	25.19	24.37	24.79	28.73	28.06	28.39
106	.80	.14	...	10.74	3.64	.50	.17	4.47	20.39	21.46	20.99	24.96	26.60	25.77
110	.31	.07	...	10.83	3.95	2.03	.27	6.14	23.33	25.95	23.67	26.66	28.97	27.42
111	1.75	.52	...	16.40	2.21	.77	.25	4.21	26.31	25.97	26.12	28.97	29.48	28.98
111	2.71	.46	...	14.43	2.67	.71	.30	6.41	28.06	27.27	27.66	27.38	27.64	27.61



## IMPERIAL STATEMENT No. III.—Deaths registered in the districts of

No.	District.	January.	February.	March.	April.	May.
1	2	3	4	5	6	7
<b>SURMA VALLEY.</b>						
1	Cachar ... ..	1,052	784	751	853	779
2	Sylhet ... ..	5,401	4,415	4,513	4,184	5,094
	Total ... ..	6,453	5,229	5,264	5,337	5,873
<b>ASSAM VALLEY.</b>						
3	Goalpara ... ..	1,468	1,157	1,201	1,704	1,636
4	Kamrup ... ..	1,050	790	738	1,035	2,551
5	Darrang ... ..	821	726	813	884	1,156
6	Nowgong ... ..	524	390	414	420	693
7	Sibsagar ... ..	1,001	842	626	976	1,186
8	Lakhimpur ... ..	818	740	588	673	803
	Total ... ..	5,682	4,645	4,680	5,692	8,025
	Total for the Province ... ..	12,135	9,874	9,944	11,029	13,898
	Ratio per 1,000 ... ..	2.00	1.63	1.64	1.82	2.29

## IMPERIAL STATEMENT No. IV.—Deaths registered according to age in the

No.	District.	Under 1 year.		1 and under 5.		5 and under 10.		10 and under 15.	
		Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
1	2	3	4	5	6	7	8	9	10
<b>SURMA VALLEY.</b>									
1	Cachar ... ..	1,373	1,167	895	730	491	392	342	276
2	Sylhet ... ..	9,915	8,222	5,536	5,150	2,814	2,223	1,608	1,162
	Total ... ..	11,288	9,389	6,341	5,880	3,305	2,615	1,950	1,438
<b>ASSAM VALLEY.</b>									
3	Goalpara ... ..	3,183	2,721	1,877	1,631	928	700	394	355
4	Kamrup ... ..	1,918	1,600	1,489	1,359	890	667	421	263
5	Darrang ... ..	1,692	1,487	755	813	398	323	301	167
6	Nowgong ... ..	980	872	538	604	393	318	221	144
7	Sibsagar ... ..	1,720	1,456	972	966	419	415	282	250
8	Lakhimpur ... ..	1,000	862	793	778	372	302	197	173
	Total ... ..	10,493	9,068	6,434	6,091	3,400	2,734	1,716	1,353
	Total for the Province ... ..	21,781	18,457	12,765	11,971	6,705	5,349	3,666	2,790
	Population ... ..	106,330	106,901	356,089	374,837	491,403	482,110	533,535	264,628
	Ratio per 1,000 ... ..	204.84	172.84	35.78	31.53	13.64	11.09	10.99	10.54



## Assam during each month of the year 1913.

June.	July.	August.	September.	October.	November.	December.	Total.
8	9	10	11	12	13	14	15
830	1,012	1,073	1,392	1,802	1,244	1,172	12,744
5,080	4,908	5,918	8,022	9,468	8,327	7,743	73,433
5,910	5,920	7,021	9,414	11,270	9,571	8,915	86,177
2,356	2,329	1,782	1,615	1,590	1,600	1,864	20,302
2,183	1,720	1,146	1,073	1,144	1,143	949	15,522
1,338	1,284	1,168	1,024	1,119	1,058	950	12,341
686	708	705	759	818	836	674	7,527
1,232	1,479	1,470	1,354	1,371	1,460	1,132	14,429
943	880	1,064	998	1,139	881	1,554	11,081
8,738	8,400	7,335	6,823	7,181	6,978	7,023	81,202
14,648	14,320	14,356	16,237	18,451	16,549	15,938	167,379
2.42	2.36	2.37	2.68	3.05	2.73	2.63	27.66

## districts of Assam during the year 1913.

15 and under 20.		20 and under 30.		30 and under 40.		40 and under 50.		50 and under 60.		60 and upwards.	
Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
11	12	13	14	15	16	17	18	19	20	21	22
346	501	719	1,091	829	626	679	478	578	373	624	414
1,635	2,122	3,390	5,078	3,802	3,487	3,285	2,350	2,771	2,084	3,815	2,984
1,951	2,623	4,109	6,079	4,631	4,153	3,964	2,788	3,349	2,457	4,430	3,398
310	433	872	981	950	735	762	592	692	491	1,034	766
361	368	620	800	659	602	636	466	557	511	694	491
174	263	622	918	898	808	725	478	506	359	425	279
149	193	294	415	373	329	324	217	294	248	338	293
293	372	752	1,096	951	995	739	581	633	494	689	428
105	243	646	1,008	987	904	723	417	518	286	410	277
1,452	1,892	3,756	5,218	4,818	4,483	3,909	2,687	3,200	2,389	3,581	2,519
3,433	4,515	7,865	11,297	9,749	8,636	7,873	5,475	6,549	4,846	8,020	5,917
231,893	245,976	526,437	563,035	501,836	399,477	393,554	224,199	167,715	136,717	120,495	114,630
14.80	18.42	14.94	20.06	18.82	21.67	25.93	24.42	29.05	33.44	66.55	51.61



## IMPERIAL STATEMENT No. V.—Deaths registered according to

Number.	District.	Population according to Census of 1911.					
		Christians.	Hindus.	Muhammadans.	Buddhists.	Other classes.	Total.
1	2	3	4	5	6	7	8
<b>SURMA VALLEY.</b>							
1	Cachar ... ..	1,117	305,935	155,633	24	8,338	470,167
2	Sylhet ... ..	1,512	1,096,950	1,364,739	20	7,450	2,472,671
	Total ... ..	2,629	1,403,985	1,520,372	44	15,788	2,942,838
<b>ASSAM VALLEY.</b>							
3	Goalpara ... ..	5,252	334,770	211,562	955	48,154	600,643
4	Kamrup ... ..	2,535	459,227	64,627	574	140,865	667,828
5	Darrang ... ..	1,913	245,341	20,305	699	109,146	377,314
6	Nowgong ... ..	1,373	177,735	15,689	41	108,698	303,596
7	Sibsagar ... ..	5,410	595,266	29,718	1,964	57,941	690,799
8	Lakhimpur ... ..	4,789	367,090	13,419	5,648	77,143	468,989
	Total ... ..	21,272	2,180,339	355,320	9,791	541,947	3,108,669
	Total for the Province ... ..	23,901	3,584,324	1,875,712	9,835	557,735	6,051,507

## IMPERIAL STATEMENT No. VI.—Deaths registered from different

Number.	District and town.	Population according to Census of 1911.	Cholera.	Small-pox.	Plague.	Fever.	Dysentery and diarrhoea.	Respiratory diseases.	Suicide.	
									Male.	Female.
1	2	3	4	5	6	7	8	9	10	11
<b>DISTRICTS EXCLUDING TOWNS.</b>										
<b>SURMA VALLEY.</b>										
1	Cachar ... ..	459,920	1,678	3	...	5,515	1,547	312	3	...
2	Sylhet ... ..	2,438,469	9,254	1,162	...	20,339	7,323	1,581	21	10
	Total ... ..	2,898,389	10,877	1,165	...	26,054	8,870	1,893	24	10
<b>ASSAM VALLEY.</b>										
3	Goalpara ... ..	588,871	464	357	...	17,510	198	57	6	1
4	Kamrup ... ..	644,608	2,813	667	...	8,971	434	164	40	27
5	Darrang ... ..	371,396	513	311	...	6,834	1,376	459	8	7
6	Nowgong ... ..	298,163	905	133	...	4,631	446	54	6	1
7	Sibsagar ... ..	677,963	532	100	...	7,274	2,405	624	15	4
8	Lakhimpur ... ..	452,781	143	34	...	4,935	1,764	980	15	5
	Total ... ..	3,037,886	5,390	1,602	...	50,155	6,663	2,278	90	45
	Total for districts, excluding towns.	5,931,275	16,267	2,767	...	86,709	15,533	4,171	114	55



classes in the districts of Assam during the year 1913.

Number of deaths registered						Ratio of deaths per 1,000 of population.					
Christians.	Hindus.	Muhammadians.	Buddhists.	Other classes.	Total.	Christians.	Hindus.	Muhammadians.	Buddhists.	Other classes.	Total.
9	10	11	12	13	14	15	16	17	18	19	20
8	7,208	4,208	...	620	12,744	7.16	25.92	27.03	...	74.35	27.10
13	30,932	41,630	2	806	73,433	8.59	28.14	30.49	100	116.24	29.69
21	38,840	45,828	2	1,486	86,177	7.98	27.66	30.14	45.45	94.12	29.28
218	9,801	7,956	11	3,176	20,302	49.12	29.28	33.35	11.51	65.95	33.60
3	11,668	1,392	...	2,459	15,522	1.18	25.40	21.53	...	17.45	23.24
29	6,901	528	...	4,883	12,341	15.15	28.12	26.99	...	44.73	32.70
24	4,832	450	7	2,205	7,327	17.48	27.17	29.25	179.73	26.28	24.79
87	11,739	471	6	2,126	14,429	16.08	19.72	15.84	3.05	36.69	29.99
32	8,650	248	104	2,047	11,661	6.67	23.50	18.48	18.41	26.53	23.62
433	53,331	10,154	128	16,896	81,202	20.35	24.58	28.58	13.07	31.17	26.12
454	92,431	55,982	130	18,382	167,379	18.99	25.79	29.84	13.22	32.96	27.63

causes in the districts and towns of Assam during the year 1913—continued.

Injuries.					Ratio of deaths per 1,000 of population.												
Wounds or accidents.	Snakes and wild animals.	Rabies.	Total.	All other causes.	Total.	Cholera.	Small-pox.	Plague.	Fever.	Dysentery and diarrhoea.	Respiratory diseases.	Injuries.	All other causes.	From all causes.		Number.	
														For the year.	Mean of previous five years.		
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
144	9	...	156	3,381	12,537	3.52	.006	...	11.99	3.36	.67	.33	7.35	27.25	25.89	1	
791	65	...	887	22,011	72,757	3.79	.47	...	12.52	3.90	.64	.36	9.02	29.63	26.36	2	
935	74	...	1,043	25,392	85,294	3.75	.40	...	12.44	3.96	.65	.36	8.76	29.43	26.29		
110	31	...	148	1,339	20,073	.78	.69	...	29.73	.33	.09	.25	2.27	34.68	31.99	3	
76	34	...	177	1,848	15,074	4.36	1.03	...	13.91	.67	.25	.27	2.86	23.38	26.36	4	
68	39	5	127	2,392	12,162	1.38	.83	...	18.40	3.57	1.23	.34	6.97	32.74	37.65	5	
36	20	...	63	1,122	7,354	3.03	.44	...	15.33	1.49	.18	.21	3.73	24.66	28.55	6	
80	7	4	110	3,653	14,208	.61	.14	...	10.74	3.68	.32	.16	4.51	20.98	25.83	7	
88	12	...	120	2,749	10,665	.31	.07	...	10.89	3.89	2.03	.26	6.07	23.54	27.55	8	
438	143	9	745	12,703	79,536	1.78	.52	...	16.53	2.19	.75	.24	4.18	26.22	29.19		
1,393	217	9	1,788	28,995	164,830	2.74	.46	...	14.53	2.62	.79	.30	6.42	27.79	27.72		



## IMPERIAL STATEMENT No. VI.—Deaths registered from different causes

Number.	Districts and towns.	Population according to Census of 1911.	Cholera.	Small-pox.	Plague.	Fever.	Dysentery and diarrhoea.	Respiratory diseases.	Suicide.	
									Male.	Female.
1	2	3	4	5	6	7	8	9	10	11
<b>TOWNS.</b>										
<b>SURMA VALLEY.</b>										
1	Silchar ... ..	8,785	27	...	...	55	38	4	1	...
2	Hailakandi ... ..	1,462	...	...	...	2	...	2	...	...
3	Sylhet... ..	14,457	8	6	...	109	47	10	...	1
4	Karimganj ... ..	6,512	12	...	...	40	6	...	...	...
5	Maulvi Bazar ... ..	2,269	7	...	...	15	7	...	...	...
6	Habiganj ... ..	6,244	33	...	...	57	19	1	...	...
7	Sunanganj ... ..	4,670	1	...	...	41	6	...	...	...
	<b>Total ... ..</b>	<b>44,449</b>	<b>88</b>	<b>6</b>	<b>...</b>	<b>319</b>	<b>123</b>	<b>17</b>	<b>1</b>	<b>1</b>
<b>ASSAM VALLEY.</b>										
8	Dhubri ... ..	5,808	19	...	...	24	10	12	...	...
9	Goalpara ... ..	5,964	9	...	...	66	16	6	1	...
10	Gauhati ... ..	12,481	4	11	...	134	6	13	...	...
11	Barpeta ... ..	10,739	1	6	...	146	34	11	3	3
12	Tezpur ... ..	5,355	5	1	...	64	17	27	...	1
13	Mangaldai ... ..	564	...	...	...	8	3	4	...	...
14	Nowgong ... ..	5,433	8	...	...	97	14	6	...	...
15	Sibsagar ... ..	5,764	1	2	...	66	4	...	...	...
16	Jorhat ... ..	6,231	...	1	...	62	13	3	...	...
17	Golaghat ... ..	2,236	...	...	...	16	4	...	...	...
18	Dibrugarh ... ..	14,563	5	...	...	124	92	30	...	...
19	North Lakhimpur ... ..	1,645	...	...	...	24	...	...	...	...
	<b>Total ... ..</b>	<b>75,783</b>	<b>32</b>	<b>21</b>	<b>...</b>	<b>831</b>	<b>213</b>	<b>112</b>	<b>4</b>	<b>4</b>
	<b>Total of towns ... ..</b>	<b>120,232</b>	<b>140</b>	<b>27</b>	<b>...</b>	<b>1,150</b>	<b>336</b>	<b>129</b>	<b>5</b>	<b>5</b>
	<b>Total for the Province ... ..</b>	<b>6,051,507</b>	<b>16,407</b>	<b>2,794</b>	<b>...</b>	<b>87,359</b>	<b>15,869</b>	<b>4,200</b>	<b>119</b>	<b>60</b>



in the districts and towns of Assam during the year 1913—concluded.

Injuries.						Ratio of deaths per 1,000 of population.											Number.
Wounds or accidents.	Snakes and wild animals.	Rabies.	Total.	All other causes.	Total.	Cholera.	Small-pox.	Plague.	Fever.	Dysentery and diarrhoea.	Respiratory diseases.	Injuries.	All other causes.	From all causes.			
														For the year.	Mean of previous five years.		
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
5	...	...	6	69	199	3.07	...	...	6.25	4.32	.45	.68	7.85	22.65	15.13	1	
...	...	...	...	4	8	...	...	...	1.36	...	1.36	...	2.73	5.47	19.51	2	
6	...	...	7	151	338	.55	.41	...	7.53	3.25	.69	.48	10.44	23.37	23.62	3	
2	1	...	3	10	71	1.84	...	...	6.14	.92	...	.43	1.33	10.90	14.43	4	
2	...	...	2	11	42	2.95	...	...	6.33	2.95	...	.84	4.64	17.72	13.59	5	
4	...	...	4	40	154	5.28	...	...	9.12	3.04	.16	1.64	6.40	24.66	19.03	6	
6	...	...	6	17	71	.21	...	...	8.87	.29	...	1.29	3.69	15.36	19.26	7	
25	1	..	28	302	883	1.98	.13	...	7.18	2.76	.38	.63	6.79	19.86	18.26		
1	...	..	1	32	96	3.25	...	..	4.13	1.72	2.06	.17	5.50	16.87	18.07	8	
2	...	...	3	31	131	1.50	...	...	11.06	2.68	1.00	.50	5.19	21.96	25.15	9	
...	...	...	...	29	197	.32	.88	...	10.73	.48	1.04	...	2.32	15.78	18.90	10	
...	5	...	11	42	251	.09	.55	...	13.59	3.16	1.02	1.02	3.91	23.37	29.05	11	
...	...	...	1	47	162	.93	.18	...	11.95	3.17	5.04	.18	8.77	39.75	31.56	12	
1	...	...	1	1	17	...	...	...	14.18	5.31	7.09	1.77	1.77	3.14	19.50	13	
3	2	...	5	43	173	1.47	...	...	17.85	2.57	1.10	.92	7.91	31.84	30.92	14	
9	1	...	10	...	83	.17	.34	...	11.45	.69	...	1.73	...	14.39	24.98	15	
1	...	...	1	25	105	...	.19	...	11.85	2.48	.57	.19	4.77	20.05	16.25	16	
...	...	...	...	13	33	...	...	...	7.15	1.78	...	...	5.81	14.75	27.28	17	
7	1	...	8	121	380	.34	...	...	8.51	6.31	2.06	.54	8.30	26.09	24.17	18	
...	...	...	...	12	36	...	...	...	14.58	...	...	...	7.29	21.88	26.67	19	
24	9	...	41	396	1,066	.68	.29	...	10.96	2.81	1.48	.54	5.22	21.98	24.12		
49	10	...	69	698	2,549	1.16	.22	...	9.56	2.79	1.07	.57	5.80	21.20	21.95		
1,442	227	9	1,857	38,793	167,379	2.71	.46	...	14.43	2.62	.17	.30	6.41	27.66	27.61		

## IMPERIAL STATEMENT No. VII.—Deaths registered from Cholera in the

Number.	District.	Circles of Registration.		Villages.		January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from cholera were reported.	Number in each district.	Number from which deaths from cholera were reported.					
1	2	3	4	5	6	7	8	9	10	11
SURMA VALLEY.										
1	Cachar ... ..	8	6	494	175	6	...	13	6	17
2	Sylhet ... ..	22	22	8,908	2,592	274	156	259	533	758
	Total ... ..	30	28	9,402	2,767	280	156	272	539	775
ASSAM VALLEY.										
3	Goalpara ... ..	21	15	2,234	78	133	25	13	25	68
4	Kamrup ... ..	9	7	1,952	26*	230	56	35	88	1,103
5	Darrang ... ..	12	7	1,537	144	9	3	23	35	156
6	Nowgong ... ..	7	7	1,405	22*	...	1	61	25	141
7	Sibsagar ... ..	10	7	1,276	203	22	11	18	54	123
8	Lakhimpur ... ..	7	4	1,702	Not available.	1	5	2	17	27
	Total ... ..	66	47	10,146	473	395	101	152	244	1,588
	Total for the Province ... ..	96	75	19,548	3,240	675	257	424	783	2,363

\* Manzas.

## IMPERIAL STATEMENT No. VIII.—Deaths registered from

Number.	District.	Circles of Registration.		Villages.		January.	February.	March.	April.	May.	June.	July.
		Number in each district.	Number from which deaths from small-pox were reported.	Number in each district.	Number from which deaths from small-pox were reported.							
1	2	3	4	5	6	7	8	9	10	11	12	13
SURMA VALLEY.												
1	Cachar ... ..	8	1	494	1	...	...	...	...	...	...	...
2	Sylhet ... ..	22	15	8,908	291	208	227	209	136	107	77	...
	Total ... ..	30	16	9,402	292	208	227	209	136	107	77	67
ASSAM VALLEY.												
3	Goalpara ... ..	21	15	2,234	72	34	38	25	33	41	56	52
4	Kamrup ... ..	9	7	1,952	17*	37	38	34	123	163	96	58
5	Darrang ... ..	12	9	1,537	115	22	29	35	74	43	43	38
6	Nowgong ... ..	7	4	1,405	12*	1	5	7	14	18	49	12
7	Sibsagar ... ..	10	6	1,276	43	...	1	8	6	16	7	6
8	Lakhimpur ... ..	7	3	1,702	Not available.	5	8	7	2	4	...	...
	Total ... ..	66	42	10,146	259	90	119	136	257	285	231	166
	Total for the Province ... ..	96	58	19,548	551	297	346	345	593	592	528	233

\* Manzas.



## districts of Assam during each month of the year 1913.

June.	July.	August.	September.	October.	November.	December.	Total.			Ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.	Number.
							Male.	Female.	Total.	Male.	Female.	Total.		
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
34	44	165	363	547	285	170	994	746	1,650	3.67	3.33	3.50	2.52	1
352	262	703	1,916	2,017	971	1,024	4,906	4,409	9,315	3.86	3.66	3.76	2.97	2
186	306	958	2,279	2,504	1,256	1,194	5,810	5,155	10,965	3.83	3.60	3.72	2.90	
73	21	...	3	3	41	87	253	239	492	.79	.84	.81	1.64	3
677	424	75	34	21	60	15	1,436	1,382	2,818	4.23	4.21	4.21	3.40	4
185	63	25	23	14	3	4	277	241	518	1.39	1.34	1.37	3.90	5
27	103	18	204	161	166	6	478	435	913	3.08	2.92	3.00	4.24	6
65	75	28	29	81	18	29	294	259	553	.80	.79	.80	2.91	7
26	18	10	18	17	3	4	76	72	148	.30	.32	.31	1.63	8
1,053	704	156	316	297	291	145	2,814	2,678	5,442	1.73	1.77	1.75	2.83	
1,479	1,010	1,114	2,595	2,861	1,547	1,339	8,694	7,783	16,407	2.74	2.67	2.71	2.85	

## Small-pox in the districts of Assam during each month of the year 1913.

August.	September.	October.	November.	December.	Total.			Number of deaths among children.		Total ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.	Number.
					Male.	Female.	Total.	Under 1 year.	One to 10 years.	Male.	Female.	Total.		
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
...	...	1	2	...	3	...	3	...	...	.01	..	.006	.01	1
12	37	26	13	49	616	552	1,168	179	205	.48	.45	.47	.27	2
12	37	27	15	40	619	552	1,171	179	205	.40	.38	.39	.23	
27	4	12	14	21	210	147	357	55	125	.65	.52	.59	.43	3
15	7	31	31	26	384	390	684	238	354	1.13	.91	1.02	1.40	
9	6	3	4	6	171	141	312	92	111	.86	.78	.82	1.26	5
3	1	18	...	5	70	63	133	44	60	.45	.42	.43	1.64	6
26	17	8	2	6	51	52	103	17	60	.13	.15	.14	.37	7
4	1	1	2	...	21	13	34	...	..	.68	.65	.67	.68	8
84	36	73	53	64	997	716	1,623	496	710	.55	.48	.52	.81	
96	73	100	68	113	1,526	1,268	2,794	675	915	.49	.43	.46	.53	

## IMPERIAL STATEMENT No. IX.—Deaths registered from Fevers

Number.	District.	Circles of Registration.		Villages.		January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from fevers were reported.	Number in each district.	Number from which deaths from fevers were reported.					
1	2	3	4	5	6	7	8	9	10	11
<b>SURMA VALLEY.</b>										
1	Cachar ... ..	8	8	494	399	562	390	354	431	422
2	Sylhet ... ..	22	22	8,908	6,920	2,241	1,881	1,940	1,833	2,196
	Total ... ..	30	30	9,402	7,319	2,803	2,271	2,293	2,264	2,618
<b>ASSAM VALLEY.</b>										
3	Goalpara ... ..	21	21	2,234	1,959	1,152	980	1,046	1,568	1,391
4	Kamrup ... ..	9	9	1,932	54*	691	541	329	654	1,054
5	Darrang ... ..	12	12	1,537	1,129	503	439	460	506	638
6	Nowgong ... ..	7	7	1,495	56*	391	260	244	285	368
7	Sibsagar ... ..	10	10	1,226	916	519	449	553	515	566
8	Lakhimpur ... ..	7	7	1,702	Not available.	328	341	227	272	175
	Total ... ..	66	66	10,146	4,168	3,494	3,010	3,059	3,740	4,424
	Total for the Province ...	96	96	19,538	11,487	6,297	5,281	5,352	6,004	7,042

\* Manas.

## IMPERIAL STATEMENT No. X.—Deaths registered from

Number.	District.	Circles of Registration.		Villages.		January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from dysentery and diarrhoea were reported.	Number in each district.	Number from which deaths from dysentery and diarrhoea were reported.					
1	2	3	4	5	6	7	8	9	10	11
<b>SURMA VALLEY.</b>										
1	Cachar ... ..	8	7	494	208	121	116	68	86	94
2	Sylhet ... ..	22	22	8,908	3,272	430	316	285	326	411
	Total ... ..	30	29	9,402	3,480	551	432	353	412	505
<b>ASSAM VALLEY.</b>										
3	Goalpara ... ..	21	16	2,234	129	15	5	6	17	21
4	Kamrup ... ..	9	9	1,932	21*	19	17	24	20	69
5	Darrang ... ..	12	11	1,537	388	72	44	53	78	122
6	Nowgong ... ..	7	7	1,495	12*	29	27	16	17	37
7	Sibsagar ... ..	10	9	1,226	889	111	111	104	165	147
8	Lakhimpur ... ..	7	6	1,702	Not available.	111	87	79	97	124
	Total ... ..	66	58	10,146	1,479	357	291	267	394	570
	Total for the Province...	96	87	19,638	4,959	908	723	620	806	1,075

\* Manas.



*in the districts of Assam during each month of the year 1913.*

June.	July	August.	September.	October.	November.	December.	Total.			Ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.	Number.
							Male.	Female.	Total.	Male.	Female.	Total.		
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
417	548	518	520	536	400	474	2,982	2,790	5,572	12.11	11.56	11.85	12.32	1
2,454	2,620	2,841	3,083	3,451	3,208	2,975	16,443	14,358	30,801	12.96	11.92	12.45	11.92	2
2,871	3,177	3,359	3,603	3,967	3,608	3,440	19,425	16,948	36,373	12.82	11.85	12.35	12.02	
2,769	2,092	1,592	1,426	1,342	1,369	1,633	9,469	8,131	17,600	29.73	29.81	29.30	26.08	3
1,151	1,003	776	738	897	692	685	4,909	4,312	9,251	14.55	13.12	13.85	16.73	4
694	745	629	505	614	628	575	3,611	3,235	6,906	18.18	18.43	18.30	19.83	5
499	450	499	398	433	487	414	2,439	2,292	4,728	15.72	15.42	15.57	16.65	6
685	721	709	679	642	751	597	3,900	3,518	7,418	16.69	16.99	16.74	12.29	7
412	400	472	438	439	421	908	2,671	2,412	5,083	10.72	10.96	10.83	12.30	8
5,480	5,411	4,677	4,904	4,327	4,348	4,812	27,026	23,960	50,986	16.63	16.15	16.49	17.43	
8,351	8,588	8,036	7,997	8,314	7,956	8,261	46,451	40,908	87,359	14.79	14.05	14.43	14.89	

*Dysentery and Diarrhoea in the districts of Assam during each month of the year 1913.*

June.	July.	August.	September.	October.	November.	December.	Total.			Ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.	Number.
							Male.	Female.	Total.	Male.	Female.	Total.		
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
104	113	105	166	289	163	169	806	689	1,585	3.63	3.07	3.37	2.56	1
551	452	538	836	1,225	1,170	868	4,034	3,374	7,408	3.18	2.99	2.99	2.00	2
655	565	643	1,002	1,514	1,333	1,028	4,200	4,063	8,203	3.25	2.84	3.05	2.09	
39	27	16	24	24	16	14	126	98	224	.30	.34	.37	.38	3
58	58	37	37	65	48	27	278	196	474	.81	.59	.70	1.31	4
187	152	158	143	142	91	99	754	592	1,346	3.79	3.31	3.56	5.26	5
26	41	74	47	62	50	34	236	214	460	1.59	1.44	1.51	1.86	6
206	344	309	291	271	278	179	1,343	1,173	2,516	3.68	3.60	3.64	4.76	7
182	186	212	194	252	140	192	1,021	835	1,856	4.10	3.79	3.95	5.23	8
698	808	806	730	816	623	540	3,768	3,108	6,876	2.31	2.09	2.21	3.03	
1,353	1,373	1,449	1,738	2,330	1,956	1,568	8,698	7,171	15,869	2.77	2.46	2.62	2.57	

## IMPERIAL STATEMENT No. XI.—Deaths registered from

Number.	District.	Circles of Registration.		Villages.		January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from respiratory diseases were reported.	Number in each district.	Number from which deaths from respiratory diseases were reported.					
1	2	3	4	5	6	7	8	9	10	11
SURMA VALLEY.										
1	Cachar ... ..	8	7	494	74	38	28	18	19	16
2	Sylhet ... ..	22	19	8,998	477	131	120	114	100	91
	Total ... ..	30	26	9,492	551	169	148	132	119	107
ASSAM VALLEY.										
3	Goalpara ... ..	21	12	2,234	38	4	3	4	7	11
4	Kamrup ... ..	9	7	1,952	19*	13	13	14	13	30
5	Darrang ... ..	12	12	1,537	122	50	43	30	36	31
6	Nowgong ... ..	7	6	1,495	16*	6	7	12	1	4
7	Sibsagar ... ..	10	8	1,226	348	48	61	36	34	52
8	Lakhimpur ... ..	7	6	1,702	Not available.	87	110	73	83	70
	Total ... ..	66	51	10,146	543	208	237	169	174	198
	Total for the Province ... ..	96	77	19,638	1,094	377	385	301	293	305

\* Mauzas.

## IMPERIAL STATEMENT No. XII.—Deaths registered from Plague

Number.	District.	Circles of Registration.		Villages.		January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from plague were reported.	Number in each district.	Number from which deaths from plague were reported.					
1	2	3	4	5	6	7	8	9	10	11
SURMA VALLEY.										
1	Cachar ... ..	8	...	494	...	...	...	...	...	...
2	Sylhet ... ..	22	...	8,998	...	...	...	...	...	...
	Total ... ..	30	...	9,492	...	...	...	...	...	...
ASSAM VALLEY.										
3	Goalpara ... ..	21	...	2,234	...	...	...	...	...	...
4	Kamrup ... ..	9	...	1,952	...	...	...	...	...	...
5	Darrang ... ..	12	...	1,537	...	...	...	...	...	...
6	Nowgong ... ..	7	...	1,495	...	...	...	...	...	...
7	Sibsagar ... ..	10	...	1,226	...	...	...	...	...	...
8	Lakhimpur ... ..	7	...	1,702	...	...	...	...	...	...
	Total ... ..	66	...	10,146	...	...	...	...	...	...
	Total for the Province ... ..	96	...	19,638	...	...	...	...	...	...









Resolution on the Annual Report of the Province of Assam for  
the year 1913.

*Extract from the Proceedings of the Chief Commissioner of Assam in the Municipal  
Department, No. 3789M., dated Shillong, the 22nd June 1914.*

READ—

The Sanitary Report for the year 1913.

RESOLUTION.

The birth-rate recorded for the province in 1913 was 33.06 per mille, which represents a progressive improvement on the rates for 1912 and for the quinquennium preceding 1912. The death-rate per mille was 27.66 as compared with 25.04 in 1912 and 27.06 during the preceding quinquennium. The Surma Valley districts were mainly responsible for the increase in the death-rate, and a comparison of the monthly district figures of deaths given in Imperial Statement III with the corresponding statement for 1912 shows that the increase in the mortality in these districts commenced in June and continued throughout the remainder of the year. It appears likely, therefore, that the comparative unhealthiness of the valley was the result of the serious floods which occurred in the districts of Sylhet and Cachar at the beginning of June.

2. It is proposed that the Sub-Assistant Surgeons who will shortly be appointed as Sanitary Inspectors in ten of the municipalities of the province shall also be employed as registrars of vital statistics, and it is hoped that considerable improvement in the accuracy of the returns for those areas will result.

Owing to the illiteracy of the village headmen it has not been found practicable to effect much improvement in the registration of vital statistics in the Hill districts, but a scheme for the introduction of a system of registration in the North Cachar Hills is in course of preparation.

The suggestions made by the Sanitary Commissioner for the improvement of the accuracy of registration in rural areas will receive attention.

3. The returns of mortality from the principal diseases show no striking divergence from the average of the preceding ten years. There was some increase in the death-rate from fever in the Surma Valley and in the Goalpara district, which continues to record a far higher mortality per mille from this cause than any other district in the province. Lieutenant-Colonel Gurdon has read with interest the Sanitary Commissioner's remarks regarding malaria on tea estates. He entirely agrees with the view expressed as to the favourable opportunity for malarial research in the tea districts, and as to the probable value of such investigation both to the tea industry and to the general population. The Chief Commissioner's proposals for the appointment of a special malarial research officer are awaiting the orders of the Secretary of State.

The provincial *kala-azar* survey was concluded during the year, with the result that in certain areas, the most important of which is the district of Nowgong, the disease is found to be showing some activity. The account given of the measures adopted in the Golaghat subdivision to combat the disease—consisting mainly in the removal of households from infected sites—is most interesting and encouraging. Lieutenant-Colonel Gurdon is gratified to hear that the people recognise the value of the measures and are grateful to Government for carrying them out; and he trusts that, if special measures are found necessary to check the disease in other districts, the efforts of Government will meet with similar appreciation, and support. He will await with interest the result of the tours of the Sub-Assistant Surgeons with travelling dispensaries in the *kala-azar* areas. The Sanitary Commissioner's proposal to make use of the provisions of the Epidemic Diseases Act will be considered in the light of the final report of the survey.

4. Water-works projects for the towns of Sylhet, Dhubri, Tezpur, and Mangaldai were prepared during the year under the supervision of the Sanitary Board, and the means of financing them are engaging the attention of Government. The Jorhat water-works are approaching completion, and schemes for improving the water-supply of the towns of Nowgong and Golaghat are in progress. Assistance was given by



Government towards the improvement of the conservancy system in Silchar and Nowgong. The Officiating Chief Commissioner commends to the notice of all municipalities the Sanitary Commissioner's remarks as to the supreme importance of the maintenance of efficient conservancy arrangements.

5. Some work still remains to be completed towards the schemes for the improvement of the rural water-supply of the Gauhati and Barpeta subdivisions, which reached the fifth and last year of their programmes in 1912-13 and 1913-14, respectively. A similar scheme for the Mangaldai subdivision, which was sanctioned in 1912-13, is in progress.

A largely attended conference on rural water-supply and sanitation was held by the Chief Commissioner at Shillong in June 1913. As a result, an immediate grant of Rs. 10,000 was made to each Local Board for expenditure on the improvement of its water-supply during 1913-14, and each Board was directed to draw up a programme of similar work to be undertaken with Government assistance during the five years commencing from 1914-15. Type plans have been prepared by the Sanitary Board for use in carrying out these schemes, the object being to ensure that all the wells and tanks constructed shall be of suitable design and adequately protected from contamination. These programmes are now coming in, and the important question of financing them is under consideration.

6. The experiment of making grants to selected villages for village sanitation, which was commenced in 1912-13, was repeated on a larger scale during 1913-14, when Rs. 12,000 were distributed for the purpose. Detailed reports as to the work effected have not yet been received. This experiment will now merge in the larger experiment in the organisation of Village Authorities which is being undertaken.

7. The sale of quinine treatments, which increased by 50 per cent. in 1912, again expanded by 25 per cent. in 1913. The experiment of employing special touring vendors to popularise the sale of quinine will be watched with interest.

8. The experience of the last two years has shown that it is not possible for the Head of the Departments of Civil Hospitals and Jails to take as active a part as he should in the operations of the Sanitary Department, and the Local Administration will shortly address the Government of India on the subject of the appointment of a separate Sanitary Commissioner for the province.

9. The Chief Commissioner desires to place on record his appreciation of the services rendered by Colonel Campbell, C.B., C.I.E., Lieutenant-Colonel MacLeod, and the Hon'ble Lieutenant-Colonel Banatvala, who successively controlled the department, and by the members of the Sanitary Board, during the year; and he thoroughly endorses the opinion expressed by the Sanitary Commissioner as to the excellent work done by Major T. C. McCombie Young, who has in a large degree been responsible for the work of the Sanitary Department since the re-constitution of the province.

He has finally to thank the Sanitary Commissioner for an exceedingly full and suggestive report.

By order of the Chief Commissioner of Assam,

A. W. BOTHAM,

*Second Secretary to the Chief Commissioner of Assam.*



